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THE PARTHENON.

From the painting by Harold B. Warren in the Boston Museum of Fine Arts.

THE FOUNDATIONS OF CLASSIC ARCHITECTURE

BY

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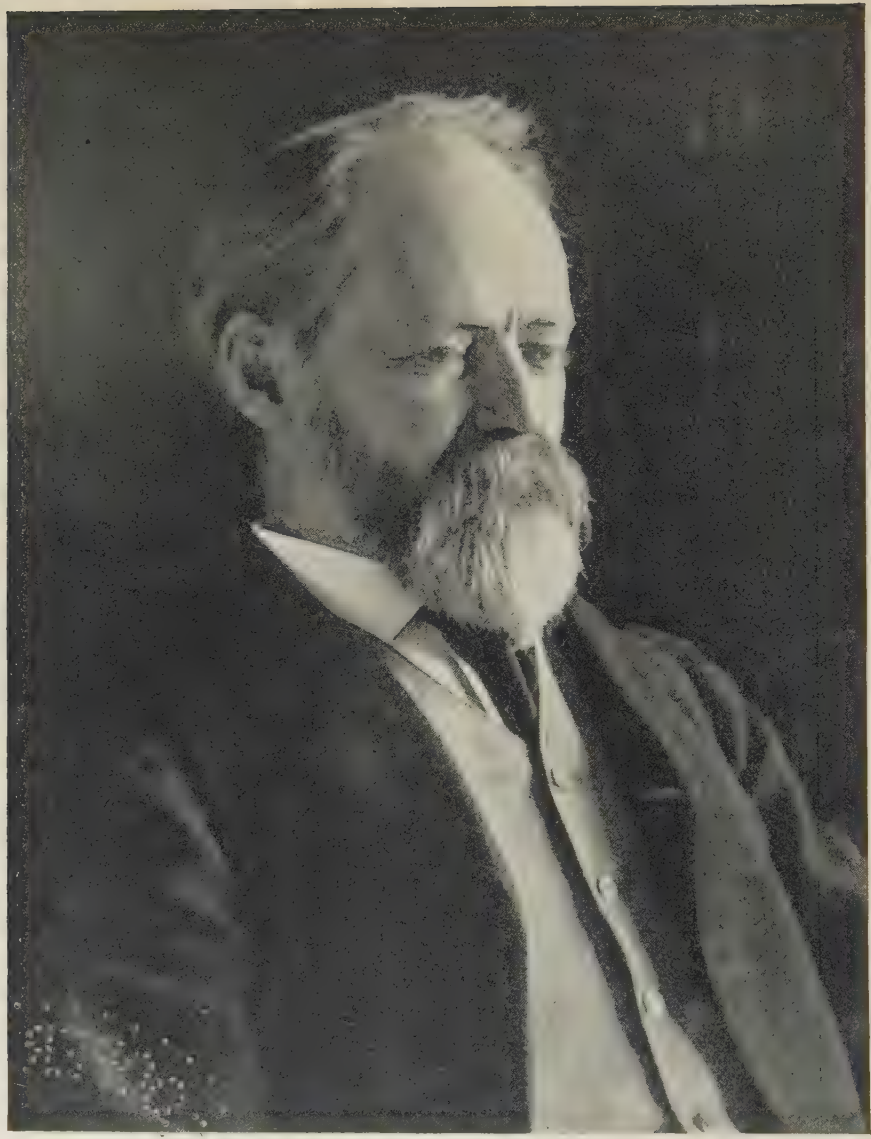

HERBERT LANGFORD WARREN
1857–1917

INTRODUCTION

In this work of Langford Warren, left in manuscript at his death, is presented in enduring form the essence of his vital teaching of the history and principles of architecture. Its importance for the generation which has heard his inspiring message, a generation which has recreated an architecture of knowledge, order, and classic beauty, is best expressed in the words of his own essay on the study of architectural history:

> "We cannot, if we would, escape the influence of all the art of the past which is brought to our doors and, as it were, thrust into our hands. Our choice lies simply between really knowing it and using it wisely in the fulness of knowledge, or knowing it only superficially and misusing and misapplying it ignorantly. . . . We must seek to combine scholarship with artistic impulse and enthusiasm, must seek to give that impulse and enthusiasm the sure basis of knowledge. For the support which the architect of the past received from tradition, we must substitute scholarship. Not the scholarship which is concerned with facts merely, with archæological study of outward forms; but the scholarship concerned with principles, which studies the art of the great epochs of the past in order to understand if possible those fundamental qualities which made it great, which penetrates to the meaning of the forms used, which analyses and compares for the purpose of gaining inspiration, in order that it may create by following consciously the principles which are seen to have been followed unconsciously in the great art of the past, developing if possible by degrees a tradition of what is best in all past forms, because it understands what to take and what to modify in order to meet the conditions of the present. Such a scholarship, we may hope, will produce an art which will not, on the one hand, change a significant and established form merely for the sake of novelty; but which, on the other, will freely mould and shape form to

meet more expressively new and changing conditions. . . . Such a study, it is clear, can be no superficial study. . . . The history of each period must be so far studied as to make clear the conditions under which and as an expression of which the forms came into being, so that the study of architectural history becomes the study of the history of civilization as expressed in architecture. . . . Such a study, under the conditions that exist to-day, is essential to those architects who would be in any real sense leaders of their profession, who are ambitious to guide their art onward to higher things."

The outward facts and the achievements of Langford Warren's life cannot be better presented than in the minute of his services recorded by the Faculty of Architecture at Harvard, which is much more than a mere official record:

Herbert Langford Warren, Nelson Robinson, Jr., Professor of Architecture, Chairman of the Council of the School of Architecture, and Dean of the Faculty of Architecture, died at his home in Cambridge, June 27, 1917, in his sixty-first year.

He was born in Manchester, England, March 29, 1857, the son of Samuel Mills and Sarah Anne (Broadfield) Warren. On his father's side he was of New England colonial ancestry, and on his mother's came of the Broadfields of Bridgenorth, Shropshire, England. His school days were passed in Manchester, except for two years, 1869–71, spent in Germany in the gymnasia of Gotha and Dresden, where he received such a thorough grounding in the German language that it was ever after nearly as familiar to him as his mother tongue. From 1871 to 1875 he studied at Owen's College, Manchester, and then entered the office of a Manchester architect, William Dawes, as draftsman. He came to this country in 1876.

From 1877 to 1879 he was studying Architecture at the Massachusetts Institute of Technology under William Robert Ware and Eugene Letang. During the five years from 1879 to 1884 he was in the office of H. H. Richardson, Brookline, who was at that time engaged on such buildings as the town hall at North Easton, Massachusetts, the Auburndale Station on the Boston and Albany Railroad, and Austin Hall of the Law School, Harvard University. In all these Warren had a hand, for he stood close to Richardson, and Richardson is known to have had a high opinion of his qualities. During the last year of his service under this great master, he was at the same time, as a special student, taking courses in the Fine Arts in Harvard College, listening to Charles Eliot Norton in Cambridge and at the Lowell Institute, and preparing in other ways for his great work later as a teacher of the History and Principles of Architecture. He left Richardson's employ in 1884 for a year of travel in England, Italy, and France, studying, sketching, and measuring, particularly the country churches of just that region of France which has been devastated by the war. The destruction of these beautiful buildings therefore touched him the more deeply, and, during his last months, he had dreamed of sharing in the work of re-building.

In 1885 on his return he set up in independent practice in Boston, with an office soon after also in Troy, N. Y. In 1886 and 1887 he was on the editorial staff of "The Sanitary Engineer," then published in New York. For some years his firm was Warren, Smith & Biscoe, becoming later Warren & Smith, which it remained till his death. Among the more important of his designs have been the Orphan Asylum at Troy, the National New Church (Swedenborgian) at Washington, D. C., the New Church Theological Chapel in Cambridge, where he attended service, the town halls of Lincoln and Billerica, Massachusetts, and the home of Mr. Walter Page at the entrance to the Fenway, Boston; but he shared in the designs which went out from his firm of many church edifices, institutional buildings, and important residences not only in New England but in the West and South. He designed with skill and restraint, and all his buildings are marked by the same scrupulous regard for historic precedent, consistency of character, and refinement of detail.

While, however, for nearly forty years he steadily maintained a connection with the practice of his profession, he was latterly able to give but little time to its actual pursuit, because of the constant demands of what had become his greater work: that of an administrative officer in Harvard University and a distinguished teacher there of his Art. In 1893–94 he had served as Instructor, from 1894–99 as Assistant Professor, from 1899–1903 as Professor, and from 1903 to his death as Nelson Robinson, Jr., Professor of Architecture. He had also lectured on Architectural History at the Massachusetts Institute of Technology. From the very beginning of professional instruction in Architecture at Harvard, he had been charged with responsibility for that instruction, and under his able and devoted leadership the subject had steadily grown in importance in the University: staff and students had both increased largely in numbers; the Lawrence Scientific School, in which the first instruction in Architecture was given, had been succeeded by the Graduate School of Applied Science, and this by the Graduate Schools of Applied Science; professional instruction in the art of Landscape Architecture had been established; both subjects had been munificently endowed, and housed in a beautiful building designed to serve their needs; and both had been set up as coördinate graduate professional schools under their own faculty, known as the Faculty of Architecture, of which faculty he was the Dean. He carried through the long task of development, organization, and administration with patience, ability, dignity, and unselfish devotion. Even after the establishment of the separate Faculty of Architecture, he continued a member of the Faculty of Arts and Sciences, and was the senior member of its Division of Fine Arts, and participated constantly in the deliberations both of the Faculty and of the Division. As a speaker on such occasions he was unusually effective, and his views as he presented them always commanded the respectful consideration, and usually the cordial support, of his colleagues. At his death he had completed nearly twenty-five years of faithful service to the University. It is, then, not as a practitioner, keenly interested though he always was in this side of his work, that his memory will live; but as scholar and teacher, and eminent authority on the historical development of Architecture. In this field lay his greatest success and his most important service to Architecture.

As a teacher he was remarkably equipped, and of abounding enthusiasm for his subject. His experience as a practising architect and as a teacher of Design, the broad range of his knowledge of general history and literature, and his appreciation and love of all the arts and crafts, made his treatment of the History of Architecture much more than mere archæology. His unusual sensitiveness to beauty and his ability to inform and refine the taste of his students by the indirect influence of his own rare delicacy of feeling enabled him to spread, among both the professional and the non-professional students who listened to his illustrated critical lectures in Architectural History, not merely a clearer understanding of the true functional and historical significance of the forms themselves, but even more an awakening appreciation and an ever increasing enjoyment of their varied beauty. Thus, in these courses, he worked at one and the same time to develop more intelligent and facile professional designers and to increase the number of discriminating and appreciative lay critics. . . .

The breadth of his interests and sympathies is to some degree indicated by his active participation in the meetings and work of various professional and quasi-professional organizations. Long a Fellow of the American Institute of Architects, he was a Director of that body from 1893 to 1896, and served on various committees, especially that of Education; he was Secretary of the Boston Society of Architects from 1891 to 1895; he had been for years a Trustee of the American Academy in Rome; and was a leader in the development of interest in the revival of craftsmanship in this country, and the organizing of craftsmen, being President of the National League of Handicraft Societies from 1907 to 1911, and President of the Boston Society of Arts and Crafts from 1904 to his death. He was also for many years an interested member of the Archæological Institute of America, and a Fellow of the American Academy of Arts and Sciences. In 1902 Harvard University conferred upon him the honorary degree of Master of Arts.

Personally he was peculiarly modest, unselfish, untiring. He held high personal and professional ideals without compromise. His response to the beautiful and the true was spontaneous, often charmingly childlike in his utter forgetfulness of self by intensity of interest in the subject.

From the beginning of the great war he never hesitated in his allegiance, because his instantaneous thought was as clear as that of Royce. The Address of the Five Hundred was essentially written by him. He gave unstintingly of his all too small store of physical energy to correspondence, resolutions, and meetings to awaken his countrymen to a realization of the issues at stake, and to rouse them to effective action by the side of England and France.

In the rich outpouring of tributes at his death, Mr. Ralph Adams Cram enlarged especially on his service in revitalizing design with Gothic forms, which he understood so well;[1]

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[1] *Boston Transcript*, July 20, 1917.

Mr. John Taylor Boyd, on his successful insistence that while America should adopt the sound and inspiring methods of Parisian teaching she must develop her own traditions of good taste;[1] Dr. Morton Prince, on his unobtrusive but indefatigable and far-reaching services to the cause of the Allies,[2] to which his eldest son, Lieutenant Arthur Warren, was soon to fall a sacrifice.

It remains to speak of his writings and of their culmination in this book. Already in the midst of constant occupation as a practitioner, teacher, and administrator he had found time to contribute notably to the literature of his profession. The leading articles in the first issue of each of two important American periodicals, the *Architectural Review*[3] and the *Brickbuilder*,[4] were from his pen. They gave an example of scholarly study of inherited forms, and emphasized the need of sympathetic and expressive handling of structural materials. Other papers studied contemporary currents of style,[5] and expressed his convictions on artistic and professional education.[6] It was on the history of architecture, however, that his professional colleagues most expected authoritative pronouncements from him. His articles on mediaeval architecture for Russell Sturgis's "Dictionary of Architecture and

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[1] *Architectural Record*, vol. 42 (1917), pp. 588–591.

[2] *Journal of the American Institute of Architects*, vol. 5 (1917), pp. 352–353.

[3] "Notes on Wenlock Priory," vol. 1 (1891), pp. 1–4, plates 5, 7, 8.

[4] "A Few Neglected Considerations with Regard to Brick Architecture," vol. 1 (1892), pp. 3–5.

[5] "French Influence in American Architecture," *American Architect*, vol. 66 (1899), pp. 67–68. "The Boston Architectural Exhibition," *Architectural Record*, vol. 6 (1896), pp. 71 ff.

[6] "What May the Schools Do to Advance the Appreciation of Art?" *New England Magazine*, new series, vol. 37 (1908), pp. 738–747; "The Department of Architecture at Harvard," *Architectural Record*, vol. 22 (1907), pp. 35–50; "The Study of Architectural History," *Architectural Quarterly of Harvard University*, vol. 1 (1912) pp. 37–44.

Building," his suggestive sketch of the development of Renaissance and modern architecture in "Progress";[1] his sketch of Colonial architecture in the series "Picturesque and Architectural New England,"[2] and his collaboration in Morgan's edition of Vitruvius encouraged them to further anticipations. They hoped for a comprehensive history on a large scale, which should trace the development of architecture in its relation to civilization, and should join with the historical narration the stimulating analysis of fundamental and universal forms, such as the classic mouldings, the Greek orders, and the Gothic systems of vaulting.

Of this cherished project of his later years he had at his death all but completed a first volume, extending from the origins of ancient styles in Egypt, Western Asia, and Greece, to their culmination in the Athens of Pericles. It fulfils the title "The Foundations of Classic Architecture" through its study not only of the formative periods of the art but of its abiding principles. While we regret that other volumes are not to follow, especially one on Gothic architecture, which he was so well qualified to analyze, we must recognize that already in this volume the treatment of later styles is implicit — the fundamental canons are established.

The manuscript, which ended with the opening words of the final portion, "The Parthenon," has been completed with the aid of the author's own notes and of notes on his class lectures. Revisions in the earlier sections have been made only where it was felt they would be in accordance with his wishes. Thus, even in the final sections, it is believed that the book represents the views of the author and not merely those of the editor, whose own opinions — naturally differing sometimes — are set forth in his own "History of Architecture." The subjects of a few of the illustrations were also indicated by the author, although the task of collecting and preparing them has fallen mainly to the editor. A particular effort has been made to reproduce the plans, details, and restorations directly from the special works dealing with the subjects at first hand, thus furnishing a body of authentic documents unequalled in any general work covering the same field. The references given in the legends furnish a convenient selected list of authorities. The drawings specially prepared for the heads of the chapters have been kindly contributed, in memory of his brother, by Mr. Harold Broadfield Warren, who has lent his interest and help at every stage of the work.

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[1] Vol. 6 (1901), pp. 190–234.

[2] "Architecture in New England: Architectural Features," vol. 1 (1899).

Fiske Kimball

University of Virginia

THE FOUNDATIONS OF CLASSIC ARCHITECTURE

From a drawing by Harold B. Warren.

THE FOUNDATIONS OF CLASSIC ARCHITECTURE

I

EGYPT

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The earliest architecture of which we have definite knowledge in any part of the world is that of ancient Egypt. It is of importance to the understanding of the much later development of the great styles of Europe, not only because it is the oldest, but still more because many of its forms underlie, however remotely, those of the European styles. Utterly different in appearance and in sentiment as are these latter forms, they yet, in many of their aspects, developed from those of Egypt. This resulted not from imitation as a motive, but from a process of evolution, as the influence of the varying conditions of environment and of civilization reacted upon the minds of successive generations of builders, in their straightforward and simple endeavor to solve, in the best and most beautiful way, the problems with which they had to deal.

Egyptian architecture illustrates at the very outset the close relationship of architectural form to the physical environment in the midst of which it is produced, and its dependence on the practical demands which the designer has to meet in giving form to his ideals. These demands and these ideals are obviously the outgrowth of his civilization, of the quality of which — usually in its best, sometimes in its less admirable characteristics — architecture thus becomes one of the most important expressions.

This is most strikingly illustrated in the case of Egypt, because of the highly unusual, indeed the unique, character of the country and its civilization. Largely also on this account, ancient Egyptian architecture is intrinsically of the highest interest.

In its more monumental and more permanent manifestations it was an architecture of temples and of tombs: the dwellings of the gods and the dwellings of the dead. Since the gods and the dead were eternal, their dwellings were made as permanent in character as possible, and certainly no architecture has to the same degree attained the expression of durability — one might say of eternity. These monumental abodes of the immortals were in form derived from the houses of the living, built of less permanent materials for the transient dwellers upon earth, to meet the needs of everyday life.

As far back into the dim past as this earliest mode of building can with certainty be traced it meets us already as an architecture of developed character, implying centuries of growth. Its primitive forms therefore are largely matters of conjecture. Moreover the early houses, built of perishable materials, even those which were contemporary with the mighty temples whose ruins still impress the traveller, have long since disappeared, and their form is to be known chiefly from the derived forms of tombs and temples, and from the representations of houses in the low reliefs of tombs, in sarcophagi and in terra cotta models, rather than from the scant remains of walls and foundations which the spade has revealed. These evidences go to show that the dwellings of the Egyptian peasantry, the fellaheen, of to-day are similar in character to the early form of house from which ancient Egyptian architecture is so largely derived. No characteristic of Egypt is more striking than its conservatism. Sun-dried bricks are to-day made of Nile mud precisely in the way shown in ancient low reliefs. The water is raised from the river to the irrigating canals in the same manner as in ancient times, by the contrivance called by the Arabs the "shadouf." The life of the peasant in Egypt has changed but little in the thousands of years of his existence.

Egypt, as has so often been said, is the creation of the Nile. For the more than thousand miles of its passage through Nubia and Egypt the great broad river is the one source of fruitfulness to a narrow valley which would otherwise be waterless and barren, for there is practically no rain, and there are no other rivers. At the delta — the rich alluvial deposit of the river itself — the fertile country widens out into a great fan, irrigated by the many channels into which the river here divides. It has been picturesquely pointed out that in form on the map this cultivable and habitable portion of the country is shaped like the flower of Egypt, the lotus, with its spreading, cuplike blossom and its long, waving, water-lily-like stem. Comparatively large as Egypt looms, as a division of the earth's surface, it is yet chiefly desert, and the fertile and habitable area is not much larger than Wales or the state of Vermont and only about half of this (5500 square miles, an area about equal to the county of York in England) is under actual cultivation. The length of the valley in Egypt proper, from the first cataract to the sea, is about the same as the total length of England and Scotland, about the same as the valley of the Mississippi from the junction of the Ohio River to the Gulf. Against the desert on either hand this narrow river valley, — never wider than about twelve miles and sometimes narrowing to less than half a mile, — is protected by rocky and largely flat-topped hills, which are of sandstone in Nubia, of granite (syenite) in the neighborhood of the first cataract, and of limestone of varying degrees of fineness along the lower reaches. Egypt is thus abundantly supplied with stone in great variety, easily accessible throughout its whole extent, and easily to be transported down the river, the great channel of communication, as it is the one source of water supply, to this long and narrow ribbon of country.

Thus situated, Egypt is peculiarly shut in upon itself, readily to be approached only along the river valley from Nubia at the south, or by sea from the coast of the Delta at the north, — where alone it is really in touch with the rest of the world, — accessible otherwise only by caravan routes across the desert which separates the valley of the Nile from the Red Sea.

The changeless climate, hot, dry, and rainless, the impressive regularity of the inundations of the great river which annually deposits its layer of fertile soil, covering the country with its wealth-bringing waters, the unique seclusion of this wonderful valley, form conditions which seem to explain the generally placid conservatism which has characterized the Egyptian people and which is reflected in their monuments. The conditions of the country necessarily made Egypt what it has remained, an agricultural community, and as has been said, the villages of to-day along the shores of the vast stream are strikingly similar, there is good reason to believe, to those which stood there three thousand, or perhaps five thousand, years before Christ (Headpiece to Chapter I). These villages are usually situated on some slight elevation near the river bank, and in many cases on mounds gradually created by the ruin of groups of earlier dwellings — from time to time destroyed by natural decay or by unusually high and therefore disastrous inundations.

There is but little wood in Egypt and what timber there is is of small dimensions. The date-palm, the acacia, the sycamore, and the tamarisk are the principal trees. The huts of the fellaheen, therefore, are built chiefly of the mud of the river banks, often consolidated and strengthened by using the reeds that grow by the waterside, and of these also the roofs are formed, the reeds resting on poles laid across the top of the mud walls. Since there is almost no rain the houses are chiefly shelters against the sun, and the roofs therefore are flat. That the mud walls may be strong they are made wider at the base and the outer face of the wall has therefore a marked inward inclination. The hut forms in plan a long rectangle. There is usually a single doorway in the longer side and there are, as a rule, no windows. In some such form doubtless the earliest houses of the ancient Egyptians were built.

Such structure is hardly architecture. It is only utilitarian building of the most primitive sort. But it is the wholesome and suggestive basis of architecture. It becomes architecture, that is to say, it becomes fine art, in so far as some pleasantness of proportion and of setting is given to this simple structure, and still more if well proportioned and significant forms have the added grace of expressive and appropriate ornament.

The evidences of low reliefs and wall paintings, of rock-cut tombs and sarcophagi, and the reminiscent forms of later temples, point to the further steps in the progress. The walls of the most ancient houses, like the huts of to day, were often formed of a light framework of poles interwoven with reeds forming a wickerwork upon which the mud was plastered. The poles and reeds were bound together at the top of the wall, on the outside, by a horizontal pole fastened to the frame by thongs, which seem to have been tied on in such a way as to form a pattern on the pole. Similar poles seem to have been used to strengthen the corners. When on this mud wall with its frame the roof-poles were placed, the ends of the reeds projecting above the cornice pole were pressed outward, the roof being allowed to project slightly beyond the wall. We have here, in all probability, the origin, the first remote suggestion, of the form and the decoration of the characteristic Egyptian stone cornice.

In the more important houses the roof was more solidly constructed. The roof-poles were plastered over with mud to form an even floor, and the flat roof, surrounded by a parapet and reached by steep outside stairways, became the pleasantest part of the house, a covered shelter from the sun being often constructed at one end of it.

Houses of the better class in the most ancient times were probably, as in the later Theban period, often built about courts, from which the chambers opened, and may have been of several stories. Like these later houses also they were doubtless often preceded by porches, the roofs of which were carried by slender wooden posts which suggested some of the most characteristic forms of the later columns of stone.

Such houses as these seem to have existed at the earliest dawn of Egyptian history and from them the latter forms of tomb and temple were derived.

Perhaps the most striking fact in the history of Egyptian art, especially of its architecture, is the remarkable persistence of its types, the similarity of general character which it maintains throughout its age-long course. The distinctive style of the Greeks lasted barely more than six hundred years from its earliest beginnings to its decline. Roman architecture, which for a time dominated the known world, lasted hardly so long; while the Gothic style, from its first beginnings until it ceased to be used, endured for scarcely four hundred years, and during this period underwent far greater changes than Egyptian architecture throughout its long course of more than three thousand, perhaps more than five thousand, years. All the many changes of European architecture have not as yet occupied so long a time.

As the subject comes more closely to be studied, however, great variations of character are to be noticed, especially in the sculpture; but in the architecture in spite of differences which distinguish the greater epochs, we have nevertheless to deal with a single style, which after the earliest developments admits but few changes of type even in detail. These distinguishing characteristics of the greater epochs need alone concern us here and we may confine our attention chiefly to the architecturally more important monuments in each of these great periods.

Egyptian history, which modern investigation has been gradually revealing, begins with King Menes who, probably between the years 3400 and 3200 B.C., founded what came to be known as the first dynasty, by uniting the two kingdoms of Upper and Lower Egypt, which seem to have existed before his day, and which already possessed a developed civilization. From the time of King Menes onward the Egyptian historian Manetho, of whose work fragments only have been preserved, writing in the third century B.C., gives a list of thirty dynasties down to the conquest of Alexander the Great, and this list has been substantially confirmed by the modern study of the hieroglyphs. The dates of the dynasties have been, and still remain, in doubt, and are variously given by different authorities, while some of the dynasties during the periods of disunion and disorder would seem to have been contemporary. In its main outlines however, Egyptian history has been unfolded with some clearness, and it is only in its larger general features that this history will here concern us.

Three great periods before the time of Alexander the Great are to be distinguished. The first is the epoch which begins with Menes and is known as the "Old Kingdom." It lasts until the close of the tenth dynasty. Architecturally it is to be remembered especially as the time of the building of the great pyramids (Figure 1) and of the various tombs known as *mastabas* that accompany them. Of this period

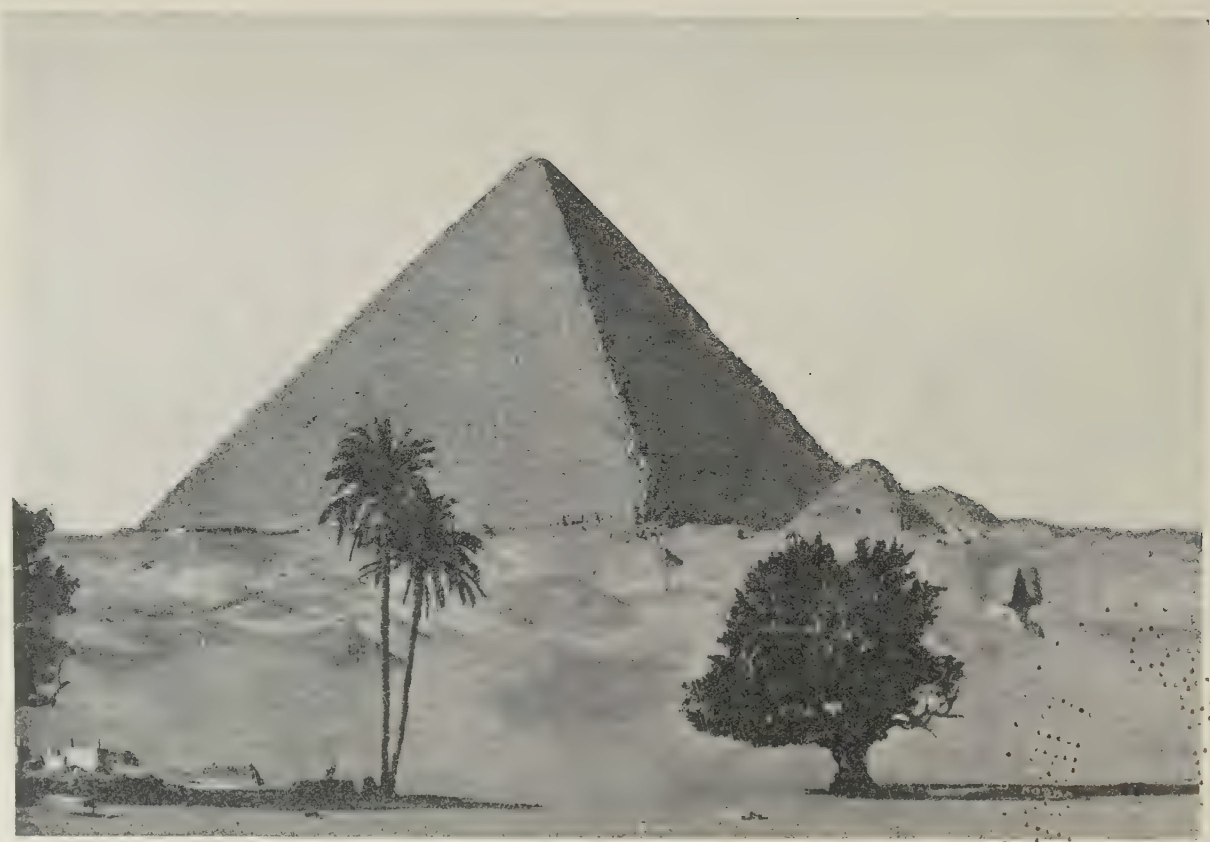


FIGURE 1. THE GREAT PYRAMID.

the third, fourth, and fifth dynasties are those of most importance to the history of architecture. The political system of the period seems to have been extremely simple, almost patriarchal. It is described by Eduard Meyer as a bureaucracy under the all-powerful will of the King, below whom all were equal save as he made them his officers. Beginning with the fifth dynasty these officers tended more and more to become feudal landholders, a condition which led to ruin and disintegration. The increasing power of the chiefs brought about the growth of virtually independent principalities, weakening the central power and producing conflicts and rivalries fatal to the prosperity of the country. With the sixth dynasty Egypt entered upon a period of decline, and in the following dynasties a time of utter ruin and chaos marks the downfall of the Old Kingdom.

The power of Egypt revived with the eleventh dynasty in what is known as the "Middle Kingdom," when princes, who had been established at Thebes during the previous period of disorder, overthrew their rivals and reunited Egypt. In this period pyramid building continued, but the construction was slighter and the size, although sometimes considerable, never equaled that of the great pyramids of the earlier epoch. Mastabas were no longer built, but were replaced by rock-cut tombs and by a peculiar type of small pyramidal tomb found especially in the neighborhood of Abydos, which came to be regarded as the site of the grave of the god Osiris, the lord of the underworld and the judge and guardian of the dead. Abydos for this reason was a favorite burial place. Architecturally and politically the twelfth dynasty, which began about the year 2000 B.C., is the most important of this prosperous period. Its political constitution was feudal, but unified by the powerful rule of the Pharaohs. There is evidence of a very high sense of moral obligation toward their people on the part of these feudal lords, whose paternal rule seems to have been just, if one may judge from the virtues on which insistence is laid in the inscriptions of the tombs. The period is associated especially with the rock-cut tombs of some of these feudal princes at Beni-Hassan (Figure 7), but it is to be remembered also as the period during which the architecture of Egypt seems to have taken on substantially the form which with slight modifications it preserved throughout its subsequent history down even to the time of the Romans. The remains of its numerous temples are found in all parts of Egypt. Again as in the earlier epoch, and generally throughout Egyptian history, the king was the all-powerful father of his people, the son of the gods, regarded almost as divine while living and deified when dead. Under him was the powerful feudal nobility whose rivalries ultimately again weakened the country. The peasantry came to be absolutely dependent on this nobility so that the height of misery in Egypt was to be a masterless man.

The prosperity of the Middle Kingdom was brought to an end, or at least checked, by the invasion of the Hyksos, or Shepherd Kings, an alien, apparently Semitic and half-barbaric tribe forcing its way into the country from the northeast across the isthmus of Suez. Their domination, during which the artistic history of the country is almost a blank, lasted during the fifteenth, sixteenth, and seventeenth dynasties. Some of the native princes during this time seem to have been able to maintain at least a partial independence in the south at Thebes and at last gathered strength to expel the invader.

The height of Egyptian power, the epoch which produced the stupendous temples, falls in the early part of this "New Kingdom," especially during the eighteenth and nineteenth dynasties. This period may indeed properly be called that of "The Empire," for now for the first time the rule of the Egyptians passed beyond their borders and included other lands. The period begins with the great ruler Amosis, the first king of the eighteenth dynasty, who, probably about the year 1580 B.C., drove out the Hyksos intruders and revived and consolidated the native Egyptian power. The capital was at Thebes and the tombs of the kings of the period are deep, rock-cut caverns of very different type from those of the Middle Kingdom. The architectural interest of the tombs is, however, slighter. Interest centres in the temples. Amosis was followed by a succession of great monarchs of the name of Amenophis (or Amenhotep) and Thothmes (or Thutmosis) under whom the power of Egypt was extended over Nubia to the south and even over the Sudan, while to the north Palestine and Syria, and under Thothmes III even distant Mesopotamia, were brought under Egyptian rule and sent the wealth of their tribute into Egyptian coffers. From Mesopotamia, as a result of this conquest, the Egyptians seem to have learned the art of burning bricks and improved methods of fortification and vault building, while the artistic influence of Egypt left its impress upon the art of Assyria. The Egyptian Empire under the third Thothmes included Nubia, Abyssinia, the Sudan, Arabia, Palestine, Syria, Mesopotamia, Kurdistan, and Armenia. It was a period of pomp and splendor and luxury.

The dynasty was brought to a close by the reign of Amenophis IV, one of the most interesting monarchs of Egyptian history, who endeavored to reform the confused polytheistic religion by introducing the worship of a single deity, the sun-god. After his death a period of disorder resulted from the religious revulsion which in such a country was inevitable. The nineteenth dynasty under Ramses I, Seti I, and their successors continued almost undimmed the brilliance of the previous reigns; but in spite of great victories the huge empire began to fall apart, and under the twentieth dynasty, under a series of kings all of whom are known by the name Ramses and who came more and more under the domination of the priests of Ammon, the power of Egypt waned, and under the last king of this line the power was usurped by the high priest. Under the twenty-first dynasty these priest-kings continued to rule at Thebes, while in the north a new dynasty set its capital at Tanis, and successively all the Egyptian conquests were lost. The Empire, properly so called, came to an end.

From this time on Egypt was almost continuously in the hands of foreigners. The descendants of Libyan mercenary generals first made themselves masters. Ethiopians then conquered the south, and ultimately the whole of the country fell into their hands. In the year 670 B.C. the Assyrians under Esarhaddon conquered Egypt, then under the rule of Tirhakah the Ethiopian. With the twenty-sixth dynasty, under Psammetichus I, came a period of revival, a veritable Egyptian renaissance. The conquering Assyrians were driven out. Egyptian arms were even carried again into Palestine and Syria. Great works of art were again produced. In the reign of Psammetichus III, however, in the year 525 B.C., Egypt was conquered by the Persians under Cambyses. Although Persian rule, in spite of frequent revolts, held

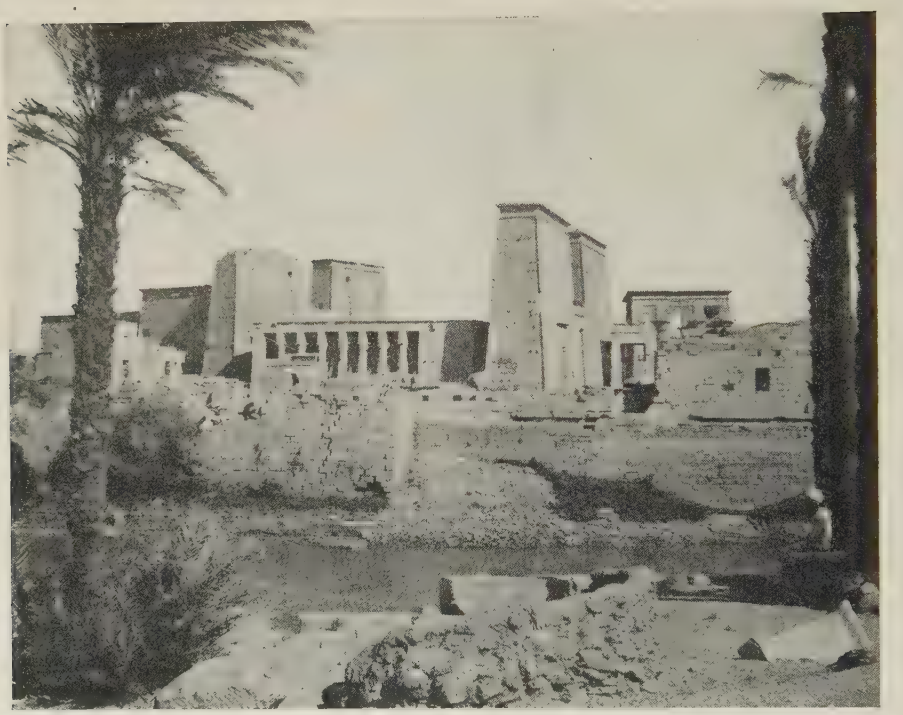


FIGURE 2. THE TEMPLE AT PHILÆ.

Egypt firmly for more than a hundred years, and with some interruptions lasted for nearly two hundred, the course of Egyptian civilization and art continued unchanged, Egyptian conservatism continued unbroken. The twenty-eighth, twenty-ninth, and thirtieth dynasties brought a brief revival of the native power; but in spite of the greatness and temporary success of the two kings of the name of Nektanebo, the second of whom is to be remembered as the builder of the great temple on the island of Philæ (Figure 2), under this latter king the Persians again conquered the country and the last of the native Pharaohs was forced to take refuge in the Sudan.

The Persian power itself was now to suffer overthrow. In the year 332 B.C., Alexander the Great took possession of Egypt, being welcomed by the Egyptians as a liberator. After his death in 323 B.C., when his great but shortlived empire was partitioned among his generals, Egypt fell to the share of Ptolemy Soter. The Greek influence of the rule of the Ptolemies had, however, but slight effect on Egyptian art. The Ptolemaic period, in spite of frequent misgovernment and disorder, was one of luxury and magnificence, and many of the best-known and most characteristic Egyptian temples, such as those at Edfoo, Kom-Ombo, and Dendera (completed by the Romans), belong to this time. When after the death of Cleopatra, the last of the Ptolemaic line, Egypt became a Roman province (B.C. 30), Roman emperors still built temples in Egypt of the ancient Egyptian type, dedicated to the old Egyptian gods, whom the bas-reliefs represent them as worshipping.

The confused polytheistic religion of Egypt, closely allied to fetichism, need not for our purpose receive much examination. Its chief characteristic is perhaps its mystery, and indications are not wanting of an esoteric religion among the priests, of a higher order than that of the common people.

The numerous deities are largely of local origin, and this or that group of gods becomes prominent as this or that locality, or this or that family, dominates. These gods are often identified with each other, while different deities in different localities seem to have similar attributes and functions. The chief god was the god of the sun, Ammon or Ra, sometimes regarded as one, sometimes as separate. There are many triads of gods like Ammon, Mut, and Khons; Osiris, Isis, and Horus, the father, the wife, and the son. Some of the gods were good and some evil. The evil gods had to be propitiated. The story of Osiris, said to have been once a king of Egypt, and his struggle with his rival, the evil god Soth, his wicked brother who usurped the kingdom, is much like the story of some of the kings. In some cases the same god, as worshipped in different parts of the country, comes to be differentiated and several local gods thus take the place of one of more national character. These fluctuations make generalization with regard to the Egyptian pantheon difficult and often misleading.

To these gods different animals were sacred, as the ram to Ammon, the vulture to his wife Mut, the falcon to their son Khons, the dog to Anubis, the god of the dead, who came to be regarded as a brother of Osiris, ruler and judge of the dead. The cow was sacred both to Isis, the wife of Osiris, and to Hathor, the goddess of the sky and of love. To Horus as well as to Khons the falcon belonged; the lioness to the war goddess Sekmet. Ptah, the god of Memphis and guardian of artists, was incarnated as the Apis bull. The cat was the animal of the goddesses Pekhet and Bastet, the ibis and baboon of the moon-god Thoth; the crocodile, of Sebek, worshipped chiefly in the Fayoom. The gods are often represented with human bodies having the heads of the animals sacred to them, and in the forms of which they were supposed to reveal themselves. These beliefs led to something very like animal worship (or may have been its outgrowth), as in the case of the Apis bulls whose tombs and colossal sarcophagi are still to be seen in the Serapæum at Sakkara, and produced the curious cemeteries of cats and of crocodiles.

Somewhat in contrast to these crude recognitions of deity is the Egyptian belief in the immortality of the soul. But the immortality imagined was generally materialistic, and the ideas were vague and fluctuating. The continuance of life after death was conditioned upon the preservation of the body; or failing that, of portrait statues of stone which served as symbols of the body. Certain formulæ were to be used and prayers said to insure favorable reception from Osiris, before whom the dead appeared and was judged according to his deeds. Some of these prayers breathe a very noble spirit and indicate high moral ideals. Besides the body, which had to be preserved as a support for the life after death, the Egyptian conceived of a species of spiritual body, the *Ka* or "double" born with the man, an essential part of him, following him through life, acting in some sense as a guardian spirit, continuing to exist after death, but having the same material needs and interests as the body. Within the Ka was the soul (*ba* or *baï*) represented in the low reliefs as a bird. The soul after death was free to come and go and to follow the gods, but returned from time to time to its abode, the tomb. These beliefs dictated the form of the tomb. They led to the embalmment, the mummification of the body, to the carving of statues of the deceased to serve as the basis for future existence if the mummy should be destroyed, and they led also to those marvellous low reliefs which have taught us so much of Egyptian daily life, representing on the walls of the tomb all the occupations of the deceased and of his people, so that supplies should not be wanting to him in case the actual offerings of food on the table of offerings in the tomb should be omitted. We thus have pictured sowing and reaping, hunting and fishing, the building of houses, the accounting of estates, while the pictured figure of the deceased sits, taking from the table of offerings represented the supplies which are symbolically brought to him.

Such in its broad outlines was the course of Egyptian history and such in general were the religious beliefs, which moulded the architecture of this ancient people and gave the chief impulse to their sculpture and painting.

The high degree of attainment, which this art had already reached at the earliest period to which history penetrates with any clearness, is impressively shown to us by the Great Sphinx which broods eternally over the city of the dead at Gizeh. What perfection of sculpture appears in the majesty of the wonderful head even in its disintegration and ruin, what marvel of mere technical accomplishment in the carving of this colossus, one hundred eighty-seven feet long and sixty-six feet high, out of the living rock! No hieroglyphs reveal its meaning or the motive of its making. Between its paws, originally a part of the huge monolith, but restored with great hewn blocks in the time of the Ptolemies and Cæsars, is enclosed a shrine.

The first structures, which in any definiteness of form have survived to our day, are the houses of the dead, the mastabas of the "Old Kingdom." The term is an Arabic word meaning "bench," in allusion to their shape. They are rectangular massive structures, in their earliest form of sun-dried brick. Later they are, often at least, faced with stone and have stone chambers. They vary in size usually from about fifty feet long, twenty or twenty-five feet wide, and twelve to fifteen feet high, to ten feet in height and fifteen in length. One of the largest near the great pyramid measures over one hundred feet in length, and some are even larger.

The walls have an inward inclination or batter at an angle of seventy-five degrees. This batter in the mastabas of Gizeh is a continuous slope, in those of Sakkara it is formed by vertical steps of stone. Their form clearly simulates that of the primitive house. They are so placed that their length runs north and south and at Gizeh they are regularly set, so that long streets are formed between them.

Their solid mass is broken usually only by a single chamber, entered through a door placed in the eastern side toward one end. Some of the larger mastabas, however, especially those of the sixth dynasty at Sakkara, have numerous halls and chambers like those of a palace. A false door, also on the east, is the symbolic door for the use of the spirit of the dead, the inhabitant of the tomb. The forms of the doors, like the niches behind the table of offerings in the chapel within, are copied from the carpentry work of the doors of the more elaborate houses of the time, with their upright posts and horizontal curtain pole (Figure 3). Sometimes the doors are preceded by porches and these occasionally have piers or columns of square section carrying lintels. The chamber is the chapel of the dead. Against the wall opposite the door is the table of offerings, on which food was placed from time to time for the use of the double, and here the prayers and formulæ for the dead were murmured. From this chamber slit-like openings sometimes communicate with smaller inaccessible chambers known as "serdabs" in which were placed those statues of the deceased which were to serve as physical basis or support for the double, and so of the spirit, in case the mummified body should perish. The embalmed body, in its mummy case and sarcophagus, was placed in a chamber usually formed in the rock below the mastaba and reached

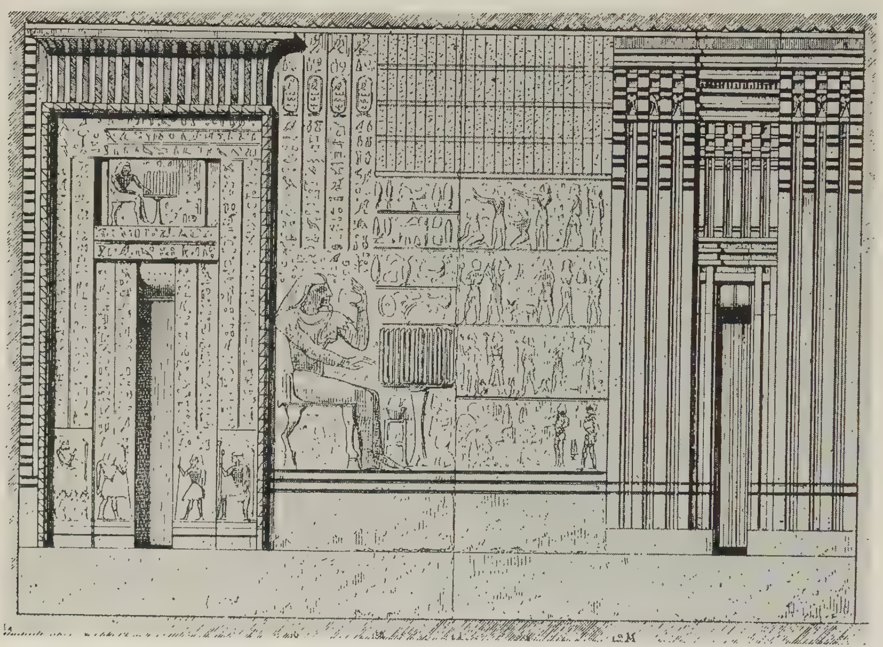


FIGURE 3. FALSE DOORS IMITATING CARPENTRY CONSTRUCTION, FROM THE WESTERN WALL OF THE TOMB-CHAMBER OF PTAH-HOTEP (FIFTH DYNASTY).

From G. Perrot and C. Chipiez' "Art in Egypt" (1883), Vol. I, Fig. 115.

by a shaft, sunk from the top of the structure through its solid mass into the ground beneath. The supplies for the dead, quarters of oxen and gazelles, jars of grain and wine, having been placed here, the shaft was filled with earth or stones and sealed without, so that when closed there was nothing to indicate from what point in the roof of the tomb the shaft descended. Everything was done to hide the tomb-chamber from marauders.

These structures can hardly be said to have architectural character. They are of interest here, not only as illustrating a phase of Egyptian life and for the light they shed on the character of the Egyptian house, but also as showing how structural forms, in their perfect adaptation to certain needs, became expressive of the civilization and ideals of a people.

Although Egypt seems formed by nature to be a stone-using country, it was only gradually that the Egyptians came to make use, from the hills on either side of the river, of the stone which could easily be transported downstream to any part of the country. Even the kings at first built their mastabas of sun-dried brick and covered them with a mound of sand. At Abydos two royal mastabas have chambers of stone, one of a Pharaoh of the first and the other of the second dynasty. These are the earliest tombs known in which any use of stone is made. Later than this, beginning with the third, but especially in the fourth dynasty, the Pharaohs begin to build their tombs in the form of stone pyramids. These are essentially, in the first instance, cumulative mastabas. We thus get the earliest form of pyramid in the stepped pyramid of Sakkara built by King Zoser of the third dynasty. It is the first pyramid of stone and rises in six stages to a height of one hundred ninety-six feet.

In scheme and purpose the pyramids are essentially like the mastabas. Sometimes, as in the mastabas, the tomb-chamber and the shaft leading to it are hewn in the rock foundations on which the structure stands. At other times, as in the case of the great pyramid at Gizeh (Figure 4), the chamber is constructed within the mass of the pyramid itself, and the greatest precautions are taken to hide this chamber, by the intricacy of the passages, by the means taken to close and block them, and, according to some authorities, by the construction of false chambers and other devices to mislead marauders. In the great pyramid is an unfinished passage and vestibule chamber hewn in the rock foundations. In the case of the pyramids the chapel is no longer within the structure itself, as in the mastabas, but takes the form of a separate building, a temple without the pyramid.

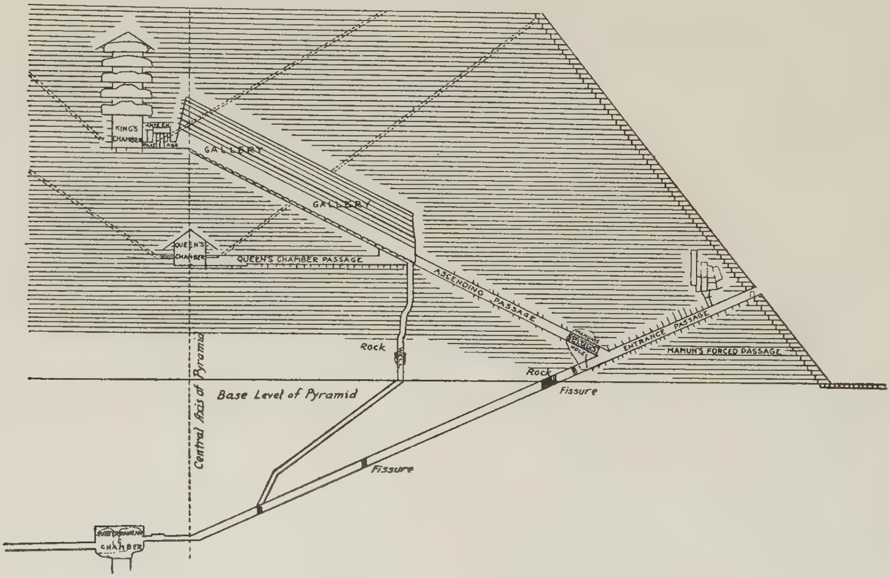


FIGURE 4. SECTION OF THE GREAT PYRAMID.
From W. M. F. Petrie's "The Pyramids of Gizeh" (1883).

Among important pyramids, next perhaps in date to that of King Zoser, comes the curious pyramid of Meydoom, some forty-eight miles south of Cairo. It is probably the tomb of Snofroo, the last king of the third dynasty, the immediate predecessor of the builder of the great pyramid at Gizeh. It is built of stone and consists now of three distinct receding stages rising from a mound consisting of the débris of the lower stages, of which it is said to have had originally in all seven. A stone pyramid at Dahshoor nearly as large as the great pyramid of Gizeh is also ascribed to King Snofroo. It still has a height of three hundred twenty-one feet, and measured over six hundred feet on each side of the base. It is perhaps the earliest pyramid of simple pyramidal form.

The largest and most celebrated of the pyramids are those of Gizeh on the western side of the river nearly opposite the modern Cairo. Save for the comparatively unimportant tombs of Aboo-Roash, five miles to the north, which include the destroyed pyramids of Tat-f-ra, the second king of the fourth dynasty, they form, — with the mastabas by which they are surrounded, — the northernmost group of the great necropolis, which stretches thence southward some fifteen miles on the high ground at the edge of the desert, where the tombs would be safe from the inundations and would not occupy cultivable land. Besides the Gizeh group, and that of Aboo-Roash, the necropolis includes the tombs of Zowiyet-el-Aryan, Abooseer, Sakkara, and Dahshoor. It lies immediately to the west of the site of ancient Memphis, the insignificant ruins of which now occupy only some three miles from north to south to the east of Sakkara, but which, even in the twelfth century, are said to have been a half day's journey in length and must have extended the whole distance from Gizeh to Dahshoor. The pyramids of Gizeh are the tombs of the Pharaohs of the fourth dynasty: Cheops, or Khufu; Chephren, or Khafra; and Mycerinus or Menkara. Of these the oldest, that of Cheops, is the largest and is known as The Great Pyramid. It was originally four hundred eighty-four feet high and measured about seven hundred sixty-eight feet on each side, but it has lost its outer covering and is ruined at the top, so that its present height is four hundred fifty-one feet and the length of each side about seven hundred fifty feet.

These vast constructions, veritable hills of monumental stone, would have been impossible but for the absolute dependence of the peasantry, and their entire subjection to the will of the king. Indeed the same is true of the massive construction of Egyptian architecture in all its periods. They are monuments of an absolute despotism and of a dependent people. Their simple structure was such as could readily be carried out by great numbers of unskilled laborers, directed by a few trained overseers under the superintendence of skilful architects. At the demand of the king the populations of whole districts devoted themselves to the work, bringing their own supplies with them, to be succeeded in their turn by others. Throughout Egyptian history this system was followed. All the great public works of Egypt have been carried out by forced labor in this way, until the system was lately abolished since the English occupation.

Herodotus, who visited Egypt 450 B.C., reports the tradition that about a hundred thousand men were employed during ten years annually for three months (probably at the time of high Nile when no work could be done in the fields) in building the great causeway which was used for the transportation of the stones from the river to the site, and twenty years more in building the great pyramid itself. Only the system of forced labor and only a period of great prosperity could have produced so colossal a structure of solid masonry covering an area of nearly thirteen acres. It is therefore in a very real sense an awe-inspiring monument of the Egyptian social and political system. Herodotus describes it as, in his day, covered with polished stones, so well jointed as to seem to be monolithic from base to summit. The removal of these outer stones, carefully cut to the angle of the pyramid, has given the stepped form we now see. Each step is about three feet high and consists of two courses. It is impressive to recall that the pyramids were at least as old to Herodotus as the ruins of the Greek temples of Herodotus' day are to us, and that, in his time, Memphis was probably still, in its decline, a city comparable in size to New York, which it somewhat resembled in shape.

The pyramids are founded on the solid rock, carefully shaped to receive them, and, like most Egyptian structures of stone, are built without mortar. The masonry is of marvellous accuracy of workmanship, notably the interior of the pyramid of Cheops in the great ascending hall and, still more, in the entrance passages and the Queen's Chamber (Figure 4). At no other period of Egyptian history does the masonry show such high technical perfection. The tomb-chamber of the pyramid of Cheops is lined with granite and is seventeen feet wide, thirty-four and one-half feet long, and nineteen feet high. Its ceiling of nine great granite beams has above it five chambers similarly ceiled, except the last, which is roofed with great slabs leaning against each other in gable form, an arrangement doubtless adopted with the idea of protecting the roof of the tomb chamber from the superincumbent weight.

The second pyramid of the Gizeh group, that of Chephren, is only slightly smaller than the great pyramid, and is of interest in that it still retains a portion of its outer covering at the top, while the pyramid of Mycerinus is still smaller, originally two hundred and nineteen feet, now two hundred and four feet, in height. It retains at its base some of its outer covering, the first sixteen courses of which were of red granite, the upper courses being of limestone as in the other pyramids.

The pyramids of the Pharaohs of the fifth dynasty form an interesting group at Abooseer, while the last king of this dynasty, Unas, built his pyramid at Sakkara. The tomb-chamber of this pyramid is decorated in color, its blue ceiling studded with stars. His mortuary temple shows one of the earliest known examples of the palm column. Here also the kings of the sixth dynasty built their similar pyramids.

The pyramids of the Middle Kingdom are distinctly inferior, both in size and character of structure, to those of the Old Kingdom. The principal group of twelfth dynasty pyramids is that at Dahshoor. They are built chiefly of brick, originally sometimes coated with stone. At Dahshoor also is an interesting pyramid of unknown date, sometimes called the pyramid of two angles. The structure is of stone and the exterior coating is in good preservation. The lower part rises at an angle of a little over fifty-four degrees, while the upper part has an angle of about forty-three degrees. (The angle of the great pyramid at Gizeh is fifty-one degrees fifty minutes.)

The most interesting pyramid of the twelfth dynasty is that of El-Lahoon (or Illahun) in the Fayoom. It is the tomb of King Usert-sen (Sen-usert or Sesostris) II. It is constructed of sun-dried bricks built upon a rocky nucleus bearing a star-shaped frame-work of low walls of massive limestone blocks. In the near neighborhood is the pyramid of crude brick, built by Amenemhat III or another Pharaoh of the twelfth dynasty.

While, after the twelfth dynasty, pyramid building did not cease altogether, the pyramid ceased to be the characteristic form of royal tomb and even when employed was small and often of very steep angle.

Interesting as are the pyramids as structures, and impressive on account of their simplicity of form and colossal size, they exerted no influence on the subsequent development of architecture.

The real interest of Egyptian architecture centers in the temple and in the development of the column of stone. While the arch as a structural form was not unknown, its use was practically confined to subterranean structures such as stone chambers. The use of the arch as an architectural form was avoided by the Egyptians, whose architecture is wholly of simple post-and-beam, or column-and-lintel, construction.

In all architecture two classes of form may be distinguished. The first, which may be called the *primary* forms, are those which have been developed altogether in the material and in the mode of structure in which they appear, and which show no appreciable signs of having been influenced by forms developed in the first instance in another material. Primary forms then must necessarily always show the characteristics of their material, and be in complete harmony with it. The simplest and noblest architectural forms will be found to be those of primary character. They result quite naturally from the instinctive recognition on the part of the craftsman of the nature and limitations of the material which he is using. In their subtler manifestations they are the outgrowth of a sympathetic skill in the handling of the material which comes from long practice in its use. But in architecture, as in other artistic crafts, there is found constantly another set of forms, which are the result of the imitation in one material of forms appropriate to and originally devised for another. These derived forms may be called *secondary*. In primitive civilization secondary forms are often found. Forms in the first instance resulting from the use of wood, which have become habitual and as it were hallowed by tradition, are especially imitated — sometimes directly and quite inappropriately copied — in stone. Such forms not being in harmonious relation with the material in which they are carried out, nor with the mode of construction used, are obviously inferior. The very *naïveté* of the use of such forms by primitive peoples gives them however a certain interest, sometimes a charm, which is wholly lacking when, as has often happened in periods of artistic decadence, secondary forms are employed self-consciously, as a display of skill, or as the result of mere vacuity and lack of thought.

While the noblest and most beautiful forms and modes of design have generally resulted from primary forms, it has sometimes happened that secondary forms, constantly employed, have been gradually modified and moulded into harmonious relation with the new material and the new mode of structure, until they finally lose all appreciable trace of their origin and seem to belong wholly to their new uses. Sometimes primary and secondary forms coalesce as the result of a long period of development. It will simplify and clarify the consideration of the forms of architecture in Egypt, particularly of the column, if these distinctions are borne in mind.

As has already been indicated, the most characteristic Egyptian forms of column are of the secondary class, and their constant use, — in spite of majesty of scale, splendor of proportion, simplicity of conception, interesting shape, and richness of coloring, — prevented Egyptian architecture from developing types of the highest character; for it was imperfect in organic expression, and to that degree lacking in complete harmony between the forms used and the mode of construction to which these forms were applied. But side by side with these secondary forms, which to the end suggest their origin in a different material, the Egyptians, from their earliest use of stone, employed forms of support which were the distinct outcome of the simplest use of this material. Great blocks of stone of square section were set on end to form posts, and other blocks of similar cross-section rested upon them to form beams. Slabs of stone were then placed from beam to beam to form the roof of portico or hall. No constructive forms could be simpler or more obvious.

This form of post-and-lintel construction in stone appears in the porticoes of some of the earliest mastabas of the Old Kingdom in which stone is used; but the most interesting of the early examples of this form of construction is the so-called "Temple of the Sphinx," discovered in the desert sands of Gizeh by Mariette in 1857. From its nearness to the Sphinx Mariette supposed it to be a temple to this god, but it is now regarded as a temple built at the entrance to the causeway leading to the temple and pyramid of Chephren. From the standpoint of architectural history its greatest interest is in the construction of the large T-shaped hall, the earliest great colonnaded hall which is anywhere preserved (Figure 5). It shows in their simplest form the principles of column and lintel construction above described, those principles which underlie not only all the architecture of Egypt but all the architecture of Greece, and in some part that of Rome.

Of the two portions which form the T-shaped plan of this hall, the head of the T, which has a simple row of six square pillars or columns down the center, has a length of seventy-nine feet and a width of twenty-three. The remaining portion, somewhat wider (29 feet), has two rows of such columns,

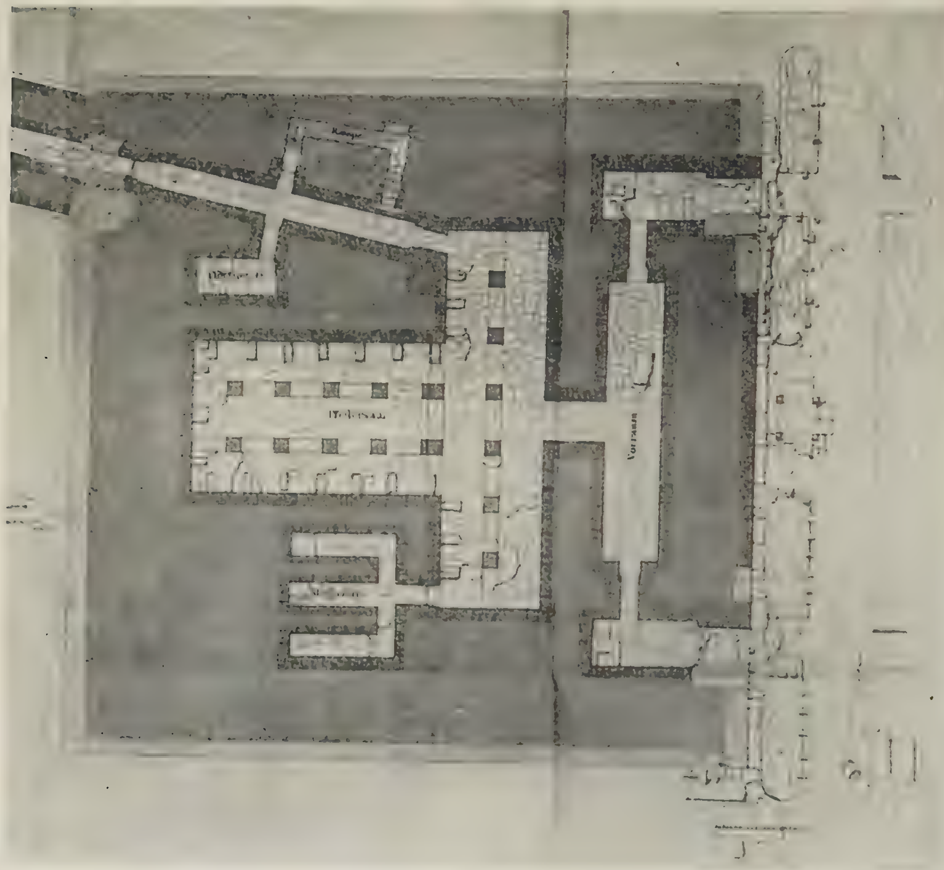


FIGURE 5. PLAN OF THE "TEMPLE OF THE SPHINX" AT GIZEH.
From U. Hölscher's "Das Grabdenkmal des Königs Chephren" (1912), Pl. 17.

and is nearly fifty-eight feet long. It is a hall therefore of no little size, comparable, except in height, and similar in plan to many churches, of which indeed it is the remote prototype. The pillars are sixteen feet high, and in plan about three and a half feet square. The great stone beams (or architraves), of about the same section as the columns, have a length of

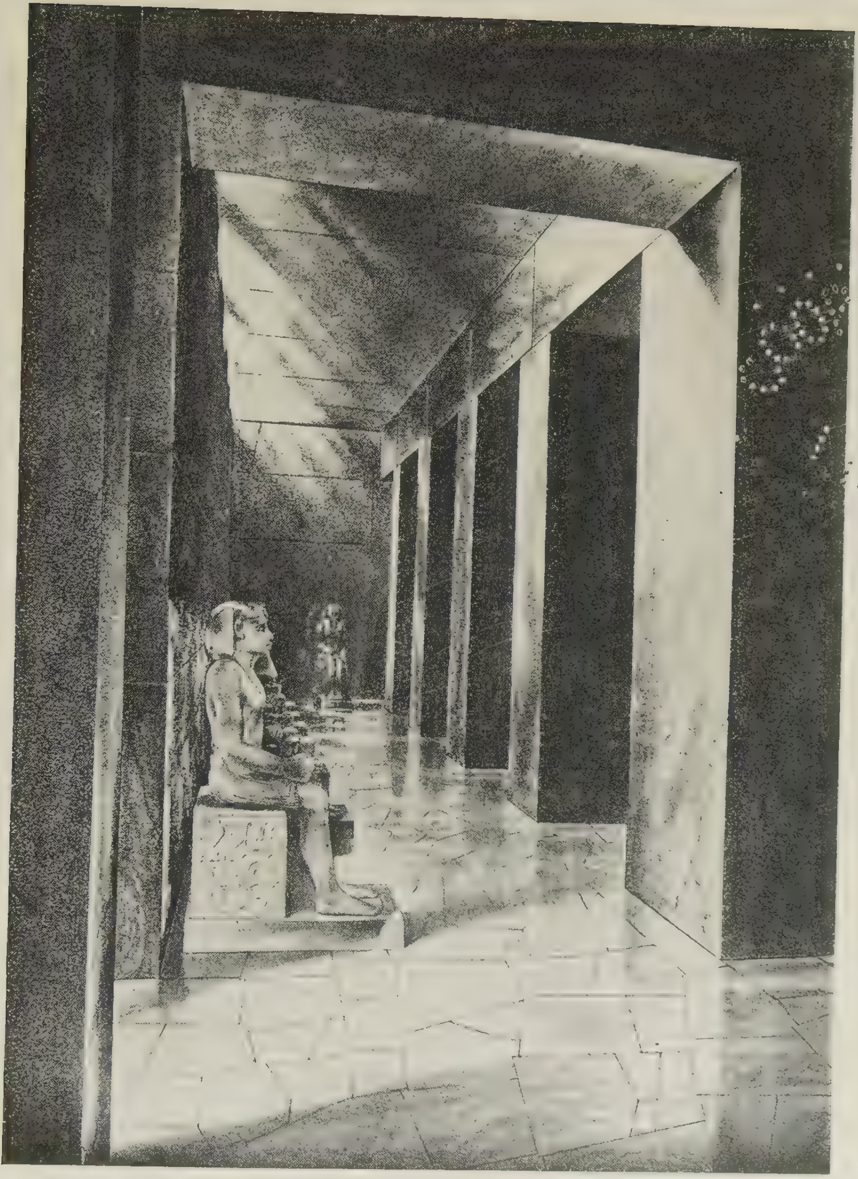


FIGURE 6. INTERIOR OF THE "TEMPLE OF THE SPHINX," RESTORED.

From U. Hölscher's "Das Grabdenkmal des Königs Chepren" (1912), Pl. 5.

some ten feet. The columns and lintels are of pink granite. The walls and ceiling-slabs are of alabaster (Figure 6). It has therefore beauty of color as well as excellence of proportion. These, and still more the majestic simplicity and obviousness of its forms, make of it a most impressive interior. Its T-shaped plan is characteristic of the Egyptian type. It is apparently the outgrowth of the arrangements of the more elaborate house, and is the fundamental plan-form which is found in the later temples; the wide hall with the entrance in the middle of one of the long sides, leading to the long chamber with the entrance at one of the narrow ends. It is the ancestor of a long line. We shall meet with the influence of this type of plan in the development of the Christian church.

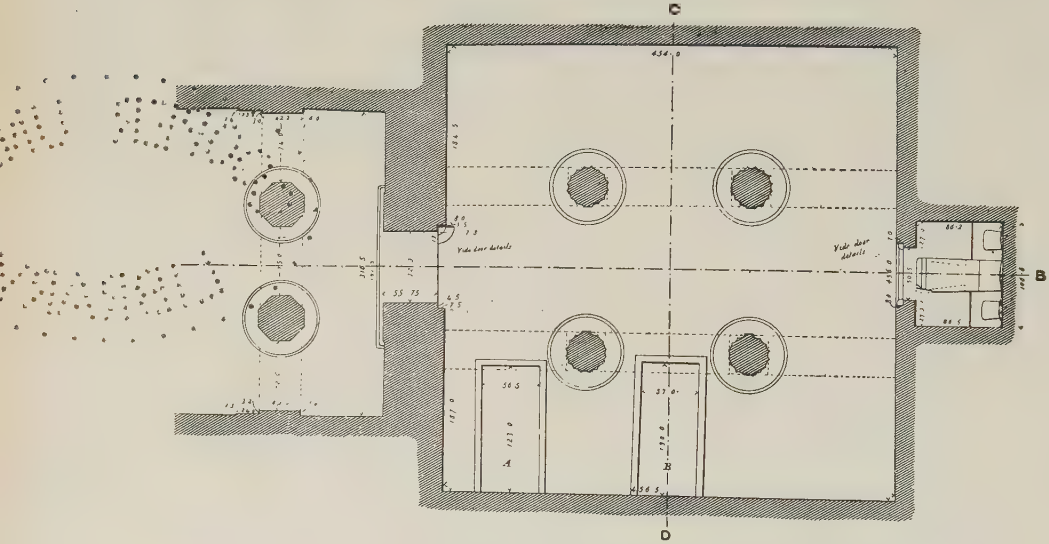


FIGURE 7. PLAN OF THE TOMB OF AMENEMHAT AT BENI–HASSAN.
From P. E. Newberry's "Beni Hasan," Part I (1893), Pl. 4.

The next step in the development of the primary column of stone is to be traced in some of the rock-cut tombs of Beni-Hassan.

Of these tombs, constructed during the Middle Kingdom under the eleventh and twelfth dynasties, there are thirty-nine. They are the tombs of the monarchs of the gazelle-nome, princes who were the hereditary governors, the feudal lords, of this region. They are all hollowed out of the hill-side, their architecture cut in the living rock. Although therefore not *built* in the ordinary sense, their forms are, of course, those of contemporary buildings. They all consist of an entrance vestibule or porch leading to an inner chamber (Figure 7). The porches in general character resemble those of the larger mastabas of the Old Kingdom, and have usually one or two columns. The roof of the inner chamber, or chapel, is also usually supported by columns (Figure 8). The form of plan varies, but in

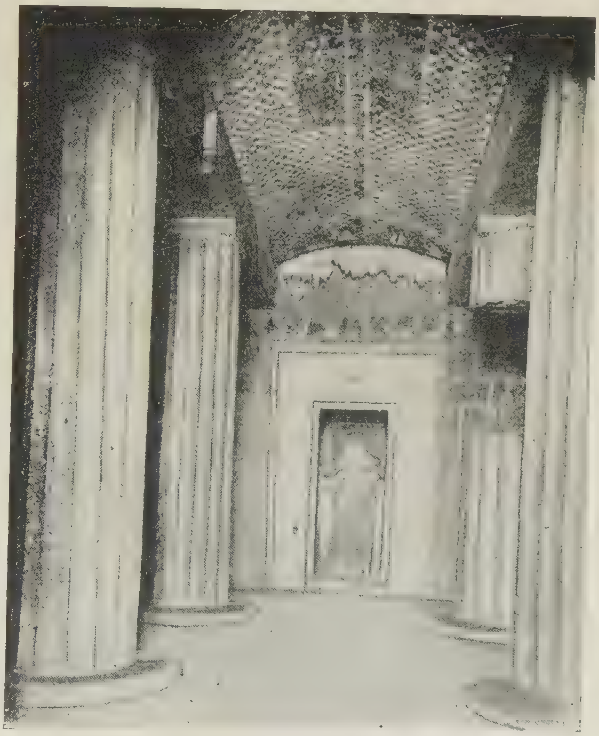


FIGURE 8. INTERIOR OF THE TOMB CHAPEL OF AMENEMHAT AT BENI-HASSAN.

some is not unlike that of the later Greek hall or *megaron*. It is entered on its narrow end, and not in the middle of the long side as in the plan-scheme of the larger Egyptian halls. The beams which the columns are represented as supporting run now in the direction of the width of the tomb, now parallel with its long axis. The sides of the chambers are decorated with the usual low reliefs, representing the life of the deceased and his people, and inscriptions telling of his offices and deeds. Opposite the doorway is the niche and stele. The tomb-chamber itself is a shallow well, cut in the floor of the chamber, and filled up as in the mastabas. The porches were, at least in some cases, originally preceded by open courts.

The columns, both of the porches and chapels of several of these tombs, are clearly rock-cut replicas of constructed columns of stone. The simple square pier has here given place to a more developed form, which, however, grows naturally out of it. Some of these columns are eight-sided. The angles of the square pier of stone have been cut off, both for the sake of gaining more grace of form and to allow of easier circulation about the columns. Corners are obviously in the way. But the top of the pier remains square, the better to carry the lintel, of square section, which rests upon it. The cutting off of the angles has been stopped a little short of the top of the pier. We have here the origin of the *abacus*, or square block which is the bearing member of a fully developed column of stone.

Having cut the angles once, it is an obvious further step to cut them a second time, thus obtaining a sixteen-sided column — or rather sixteen-sided *shaft*, for we must now distinguish shaft from *capital*, or crowning member, which in this case consists of an abacus only, the shaft and capital together making the *column*.

The sixteen-sided shaft may now be slightly tapered upward, still more clearly distinguishing the abacus, which retains its full width, and giving more elegance to the whole column. The decorative effect of the vertical lines having been observed by the builders, this is emphasized by slightly hollowing the sixteen sides, thus producing sixteen channels or *flutes*. All these forms are to be seen in the columns of these rock-cut tombs of Beni-Hassan.

Above the architraves that rest on these columns are found, cut in the rock, the representation of the ends of poles seeming to support the flat roof, the edge of which is also represented in the rock. It is clear therefore that in the building of the time, a mixed construction was sometimes used ; columns of stone supporting a superstructure of slighter material. The attempt has been made to show that these rock-cut columns themselves represent columns of wood, and to derive the abacus from wooden construction. But there is nothing in these columns to suggest the slighter material and the abacus is not a member which has any function in a true wooden construction, while in stone these forms are simple and obvious.

This type of column seems to have been but rarely used in Egyptian architecture. It is found however in one of the halls of the great temple of Karnak of the time of Thothmes III in the eighteenth dynasty, and still more conspicuously in the beautiful colonnades of the temple of Deir-el-Baharee, built by his sister Queen Hatshepsu (Figure 9).

Egypt did not develop any farther the primary column of stone. The more characteristic Egyptian stone column is, as has been said, of the secondary type, derived from wood.

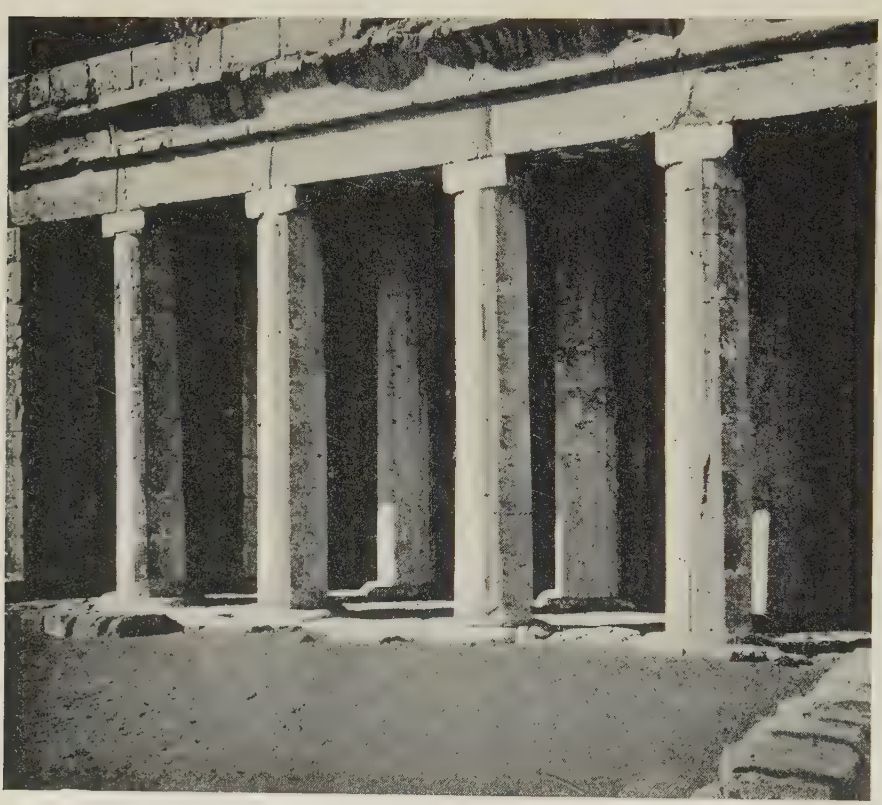


FIGURE 9. PORTICO OF ANUBIS IN THE TEMPLE AT DEIR-EL-BAHAREE.

The construction of the parts of the early porches of wood is indicated by the forms of hieroglyphs and by the wall-drawings of the tombs. Fanciful as these often are, bearing about the same relation to real buildings as does the fantastic dream-architecture of the Pompeian wall-paintings of a later age, they yet are necessarily founded on actual objects, and it is not difficult to reconstruct in imagination the general forms of the real architecture they symbolized. They seem to show that the slender supports of these earliest porches must often have been formed of bundles of the papyrus reeds which grew abundantly along the banks of the river and of the irrigating channels. The horizontal bands of color in early representations of columns seem to indicate the thongs which bound them together. The corner- and cornice-poles were perhaps often formed in the same way, and it is known that bundles of reeds were used in the making of the early boats. When wood was employed, for supports of more importance than could be afforded by bundles of reeds, the wooden shafts were frequently carved in a manner suggested by these bundles. This also seems to be indicated by some of the wall-paintings.

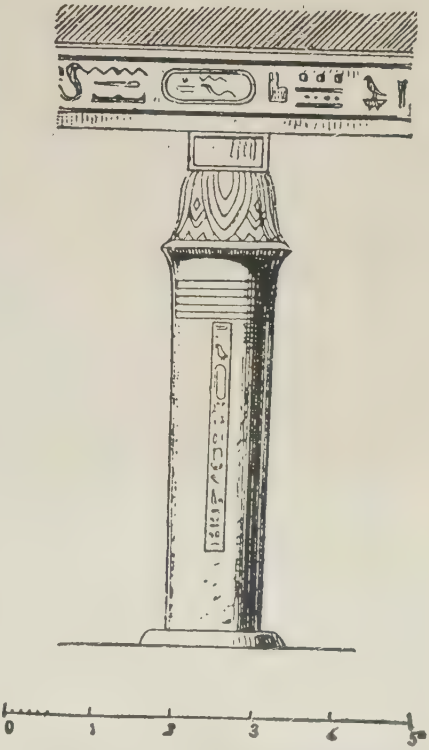


FIGURE 10. COLUMNS FROM THE PROCESSIONAL HALL AT KARNAK.

From G. Perrot and C. Chipiez' "Art in Egypt" (1883), Vol. II, Fig. 83.

The wooden columns seem usually to have been furnished at the top with a tenon for insertion into a mortise in the beam. Below the tenon the post was often carved or turned into a bell form, clearly shown in the early hieroglyphs. This readily explains the origin of the huge inverted bell-capitals of stone used in the great Processional Hall of Thothmes III in the great temple at Karnak, where the shafts taper downward (Figure 10), forms the most unreasonable in stone, and indicating to an unusual degree the imitative motive underlying most Egyptian architecture.

The plants and flowers of Egypt played a prominent rôle in the formation of Egyptian architectural and decorative form. It is evident that the ancient Egyptians were very fond of flowers and that they constantly used them in the adornment of their persons and their houses. The plants most used were the papyrus and the varieties of lotus. The papyrus has almost disappeared from Egypt, but is found now in abundance in certain places in Sicily. It grows in great masses along the watercourses, and is frequently thus shown on the low reliefs and wall paintings, in representation of hunting scenes upon the river (Figure 11). Its tall slender stems, often six feet high, rise from a sheath of long sword-shaped leaves and are crowned by a curious bell-shaped tuft. The stems of the papyrus are triangular in cross-section with slightly convex sides. The lotus, of which there are several varieties, is much like our water-lily, its flower and bud especially being of similar form. Its leaves however do not float on the water but grow above it, and are somewhat bell-shaped rather than flat. The seed-pod also is of bell shape.

The wooden columns of the primitive buildings were, especially we may suppose on festival days, often adorned with flowers and palm leaves, the colored ribbons that bound them in place gayly streaming in the wind. This would naturally suggest carving similar forms as a decoration at the top of the wooden post. Such wooden capitals undoubtedly were the prototypes of the later Egyptian stone capitals, of the palm-leaf, lotus-bud, and campaniform types, the latter suggesting the opening calyx of papyrus or lotus. These more usual forms of Egyptian capital are wholly decorative in purpose. They have no structural function whatever and are not to be regarded as structural members.

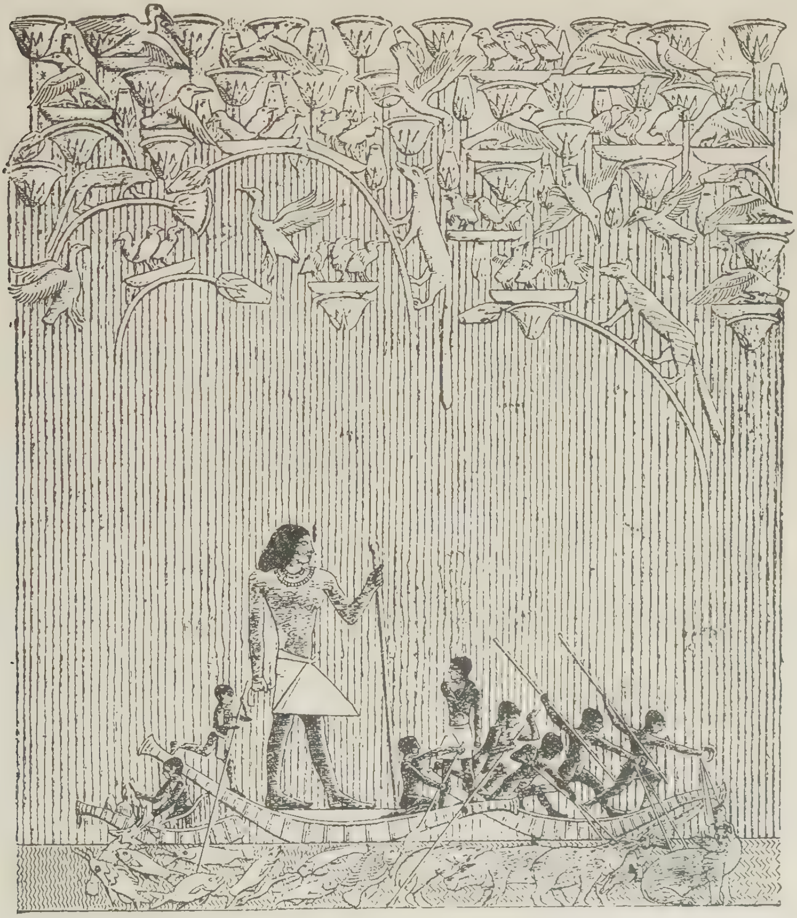


FIGURE 11. PAPYRUS IN THE MARSHES. RELIEF FROM THE TOMB OF TI.
From G. Perrot and C. Chipiez' "Art in Egypt" (1883), Vol. I, Fig. 8.

When columns of this form came to be imitated in stone, they still at first retained something of the slenderness of proportion of the wooden column. Gradually however the column increased in size and at the same time its proportions became more robust. At first there was just as much elaboration in the decorative form of the column, and the tendency to treat the whole column as if conceived of as a growing plant may even have increased. In this way shaft and capital attained an ideal unity which they could not have if the capital were treated as a detached decorative member applied to the shaft, as probably in the earlier wooden post. The lower part of the shaft was drawn in above the base, shaped in imitation of the growing papyrus plant itself, and painted to represent its sheath of green leaves, while the bundled posts, — in spite of their great size, — were sometimes given the characteristic papyrus cross-section. The post or column was set upon a broad disklike base to distribute the weight and to give it firm bearing, as had been previously done for the wooden post; but the stone base had less relative spread in the column of stone than had been given to it when it was to carry the wooden post.

Egyptian columns of secondary form are of three main types, which may be distinguished by the forms of their capitals. These are the *palm-leaf column*, whose capitals are of simple cavetto section decorated with palm leaves; the *lotus-bud column*, whose capitals have the outline of a lotus bud (called by some writers, on account of the original form of the bundled shaft, "papyrus columns"); and the *campaniform column*, the capital of which is in the form of a calyx or inverted bell, suggesting the representations of the papyrus tuft or blossom in the low reliefs.

Stone capitals of the palm-leaf and lotus-bud types date back to the Ancient Empire. The oldest examples have been found in three structures at Abooseer. Of these the earliest are the palm-leaf columns in the tomb-temple of Sahureh, the second king of the fifth dynasty, and the contemporary lotus-bud columns from the mastabas of Ptah-Shepses, an official of the time of King Sahureh (Figure 12).

The skill and sense of beauty which existed at this early time is shown in the carving of these capitals. They evidence a delicacy of feeling for natural form, a grace of line, and a refinement of artistic quality which is lost in the later more conventional examples, a fate that overtook the figure sculpture also, the earlier examples of which are finer and truer to nature. The shaft consists of six stems of nearly circular section, not

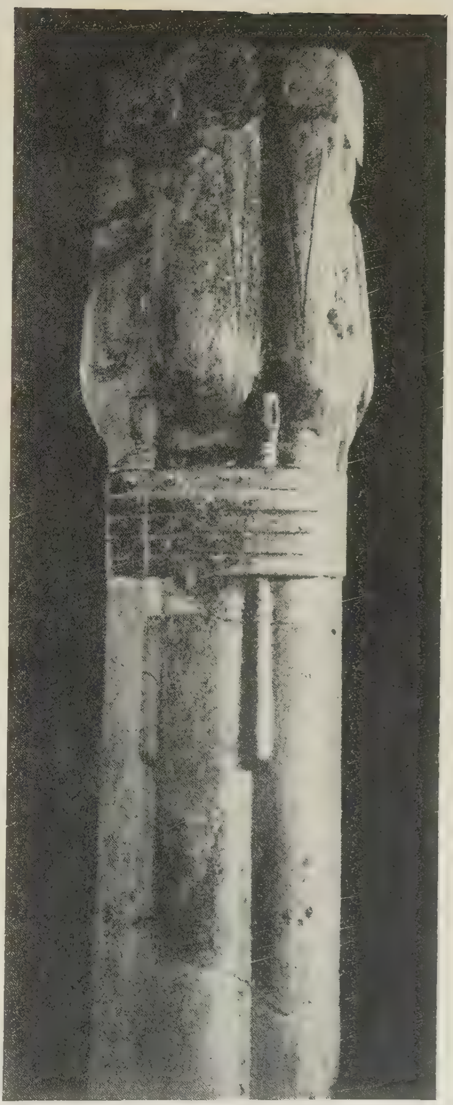


FIGURE 12. LOTUS BUD COLUMN FROM THE TOMB OF PTAH-SHEPSES, ABOOSEER.

drawn in at the foot, and resting on the usual disklike base. These stems are bound together at the top by five bands, which serve æsthetically to separate the capital from the shaft. The effect would have been unfortunate if other horizontal bands, which must have existed in the original bundled shaft, had also been shown. Each stem bears its own bud, and the junction of stem and bud is treated with surpassing delicacy of feeling. And yet, while the artist has shown his sensitive appreciation of natural form, nothing is directly copied from nature. The same is true of the treatment of the buds themselves. As always in Egyptian art the effect is enhanced by color. The shaft is blue, the bands are alternately of different colors, the small buds and stems which they seem to bind in place (carved with the same delicacy as the larger ones) stand out green against the blue shaft. The sepals are painted blue like the shaft, with yellow veins, the first row of petals is green, and the second row (just visible at the top), red. The color therefore is wholly conventional.

The third of these early examples at Abooseer is found in the mortuary temple of King Newessereh, also of the fifth dynasty, where fragments of lotus-bud columns of granite were found. At Sakkara the mortuary chapel of King Unas, as already noted, shows examples of the palm-leaf column.

In the Middle Kingdom the lotus-bud columns (which remain throughout ancient Egyptian history the most characteristic form) show much less refinement of treatment. Some of the tombs at Beni-Hassan have columns of this type. The little stems have lost their buds and the delicacy of form and the close observation of nature is gone. The shaft has four stems and, in addition to the usual bands at the necking, is banded in color throughout its height. Otherwise these columns are of precisely the same type as those of the tomb of Ptah-Shepses at Abooseer. In all these columns there is at the top, necessarily, an abacus to carry the stone beam or architrave. It results naturally from the operation of the stone cutter, who in cutting out this type of column from the monolithic rectangular block of stone (of the same shape as the simple piers of square section in the "Temple of the Sphinx") leaves the top uncut. This allows the abacus to project somewhat beyond the top of the capital. In many cases however the abacus is cut back so as to have the same width as the diameter of the top of the bud.

Of the Middle Kingdom, besides the columns of this type at Beni-Hassan, lotus-bud columns of the twelfth dynasty have been found at Tanis, at Bubastis, at Howara. These have eight stems in the shaft, and three much conventionalized buds with their stems in each hollow between the shaft stems, at the junction of shaft and capital. At Bubastis, at the time of Senusert III (Usert-sen), a central aisle of the great hall of the temple seems to have been formed of lotus-bud columns, while in the side-aisles palm-leaf columns were used. The simple, cylindrical, palm-leaf columns of the Tomb of Tehutihotep at El-Bersheh are also of the twelfth dynasty. They rest on a base of unusual width.

M. Foucart ascribes to the Middle Kingdom several other columns of the same lotus-bud type, now in museums, which have hitherto been dated in the early period of the Empire. These columns are of granite or fine limestone, monolithic, polished and beautifully finished. They are however of more conventional form than those of the Old Kingdom. All over Egypt there are numerous remains of this period, in many cases disguised by the inscriptions of later kings. Increasingly the evidence goes to show the splendor of the architecture of the twelfth dynasty, and the enormous number of temples and tombs that were built in all parts of Egypt.

With the downfall of the Middle Kingdom and the invasion of the Hyksos, Egyptian art seems to have suffered complete eclipse until after the expulsion of these invaders and the revival of native Egyptian power in the Empire.

This revival in the eighteenth dynasty brought with it a revival of Egyptian art, after an interval of some two hundred years, which at first seems to show little change as compared with the work of the twelfth dynasty.

Amosis, the first king of the eighteenth dynasty, the conqueror of the Hyksos, was too busy with the reorganization of his kingdom and the consolidation of his power to undertake extensive building. Even under his immediate successors but little was begun and less completed. The building of a great temple — even without regard to the additions of later kings — was nearly always an affair of several reigns. The work was necessarily slow. Buildings of purely utilitarian character, palaces and houses, were built of perishable materials. Only the kings had the necessary command of resources, and then only in the most prosperous periods, to undertake the construction of the great stone temples. For in ancient Egypt all salaries, all wages, were paid in kind. There was no money. All commerce was direct barter and exchange of merchandise of whatever sort. The quarries, the workshops, were therefore for the most part royal undertakings. To obtain stone or other material from a distance involved great expeditions. In the twelfth dynasty a powerful lord sent two hundred men to the quarries of Hammamat for stone for his sarcophagus. But the temples were necessarily always built by the king, who after a successful war devoted a part of his booty to the god who had given him the victory, and in building the temples employed the slaves, his prisoners of war.

The first of the great structures of this period of which there are considerable remains is the partially rock-cut temple of Deir-el-Baharee, built by Queen Hatshepsu, the daughter and successor of Thothmes I, in a series of three enormous terraces against, and partly cut out of, the rocky hillside on the west bank of the Nile overlooking ancient Thebes, the great capital of this period, which occupied both sides of the river. The numerous colonnades of this temple, supporting the ceilings of the halls or flanking the great courts, have with few exceptions sixteen-fluted columns of the Beni-Hassan type. Some square piers and Hathor-headed columns are also used. The lotus-bud order does not appear. In the near neighborhood of the temple which he designed and built is the tomb of Sen-mut, Queen Hatshepsu's architect, who also set up her two great obelisks in the temple of Karnak.

Under Thothmes III, the great conqueror, — the brother, coruler, rival and successor of Queen Hatshepsu, who cut out her figures and inscriptions in the temple of Deir-el-Baharee, — great constructions were undertaken in many parts of Egypt, notably important additions (including the Processional Hall already referred to) added at the rear of the colossal temple of Ammon in Thebes, now known as the temple of Karnak, which came to be the largest of all the Egyptian temples and one of the most stupendous buildings in the world. The lotus-bud columns of Thothmes III are in general form similar to the fine monolithic bundled shafts of polished granite of the time of the Middle Empire; but they are made of sandstone in several drums and were originally covered with fine stucco and decorated in color.

This was the mode of column construction usual in the eighteenth dynasty. A beautiful example of it was formerly to be seen in the charming little shrine built by Amenophis III on the island of Elephantineh. It was measured and drawn by the Napoleonic expedition, but was wantonly destroyed in 1822 by one of the Turkish governors. It was quite unusual in arrangement, since it anticipated the form of the Greek peristylar temple, but like the Roman temples of later time it was set on a high podium and was approached by a flight of steps in front. Lotus-bud columns flanked the entrance and were similarly used at the rear, while the side colonnades were formed of square piers.

The Temple of Luxor, also built by Amenophis III close to the eastern shore of the river at Thebes, has similar columns on much larger scale (Figure 13), and is the earliest example remaining to us in anything like completeness of a great temple built wholly above ground (*i.e.* not partly rock-cut like the temple of Queen Hatshepsu at Deir-el-Baharee). Like all Egyptian temples it is built throughout — columns, walls, and ceilings — of stone, which still, as in all the earlier structures, is laid without mortar.

The gateway which was the original entrance to the temple led between two huge gate towers, or pylons, into a courtyard, measuring about one hundred and fifty feet square, surrounded, on three sides by a double row of lotus-bud columns. The fourth side, opposite the entrance, is occupied by a *hypostyle hall* one hundred feet in length (*i.e.* a hall the roof of which is supported by columns). The colonnades

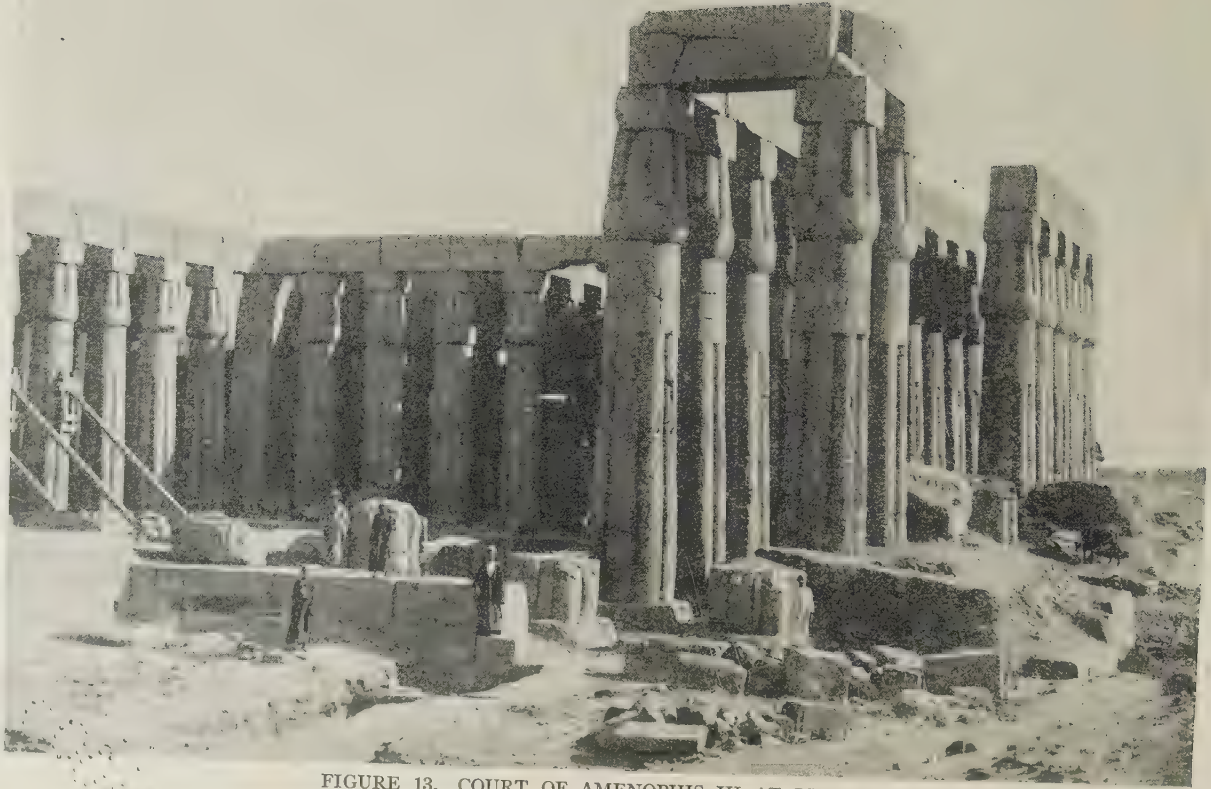


FIGURE 13. COURT OF AMENOPHIS III AT LUXOR.

which support the roof are arranged in four rows of eight columns each, with a central aisle, and open directly into the court, thus forming a colonnaded vestibule to the main temple. This hall is separated by a wall from an inner court, into which a monumental doorway opens from the wide central aisle of the colonnade. Beyond the court a second hypostyle hall with four columns leads to the sanctuary, surrounded, as almost always in important temples, by a corridor, and with a door at each end. About it are colonnaded halls and smaller chambers, and behind it a hall with two rows of six columns each, usually known as the processional hall. Behind this are still other chambers with column-supported ceilings of stone.

All the columns in this part of the temple are of the lotus-bud type; but they differ in subtle ways from the columns of Thothmes III. The outline of the shaft is more rigid, it is less drawn in at the base. The bundled stems under the necking-bands below the capital have flattened into mere strips having no resemblance to the stems of plants. What in the earlier capitals were buds have now become mere continuations of these vertical strips or bands; but above the necking they are cross-banded, so that each group repeats the bundled formation of the shaft itself, thus giving unity to the whole design. The necking-bands themselves have also become absolutely flat. The result is to make the horizontal section of the lower fourth of the capital and the upper fourth of the shaft cylindrical, decorated with lines which are hardly more than vertical and horizontal scratches separating the bands of color decoration. The upper fourth of the capital is occupied by the square abacus, on which is carved the cartouche or signature of the king, which on some of the columns is repeated on panels, which interrupt the bundled shaft. It will be noticed that the proportions of the subdivision of the bundled necking stems and of the capital, which is twice as high as its lowest diameter, repeat the subdivisions of the shaft itself. The scale of these columns, though considerable, is moderate as compared with those of later times. Those of the hypostyle hall are about twenty-two feet high and have a maximum diameter of about three feet ten inches, which diminishes to about three feet four inches at the necking.

In front of the temple as thus constructed Amenophis himself seems to have begun a still larger hypostyle hall, but only the central aisle of two rows, each having seven columns fifty-two feet high with campaniform capitals and cylindrical shafts, was completed. Later kings enclosed these colonnades with walls and built pylons in front, which thus gave it the exceptional form of a great colonnaded corridor. This again is preceded by the great court built by Ramses II of the nineteenth dynasty and the huge pylons which now flank the entrance. These additions produced an ensemble having a total length of eight hundred thirty feet.

The *pylon* or gate-tower is one of the most characteristic of Egyptian forms. It is a solid mass of masonry, pierced only by a narrow staircase leading to its summit, is rectangular in plan, and with sloping or battered sides. It is crowned with the throat-moulding cornice, the lower pole-like member of which, the bead, is continued down the angles. It is therefore in its mass a monumental version of the original form of the house. In front its sloping sides are pierced with huge vertical slots ending in sockets slightly above the base. They originally held mighty wooden masts, which must have been brought from foreign countries, held in place near the top of the pylon by large beams projecting from the wall, the socket holes for which are still to be seen. The low reliefs constantly represent such pylon masts, carrying streaming banners from their peaks, which stretch some distance above the top of the towers. In front of the entrances to the temple were usually placed statues of the king. In the case of Luxor there were four statues of Ramses II in front of the outer pylons, two sitting and two standing. The seated figures are about forty-five feet in height. In front of these — again a characteristic adornment of the façades of Egyptian temples — were set up two obelisks of pink granite, tapering monoliths with pyramidal apex, the inscriptions on the sides of which referred to the dedication of the temple or recorded the exploits of the king. One of these obelisks of Luxor now forms the chief adornment of the Place de la Concorde in Paris.

The temple was approached by an avenue bordered by carved figures of recumbent rams, each with a small image of Amenophis III in front of it. Figures of sphinxes were often used in this position. If one recalls that the fronts of the temples and the figures were enriched with color, it is possible to form some idea of the imposing and peculiar effectiveness that such a temple must have had as one approached it.

The columns of the court of Ramses II at Luxor illustrate the changes that had taken place in the design and construction of the columns between the eighteenth and nineteenth dynasties.

Already in the buildings of the reforming king Amenophis IV, toward the end of the eighteenth dynasty, lotus-bud columns with cylindrical shafts had been employed, but the work of Amenophis IV, as illustrated in the remarkable ruins of Tell-el-Amarna, with its redundant richness and comparative freedom in the employment of natural form, is to be regarded mainly as but an interesting episode in the history of Egyptian art which does not disturb the main current of its development.

With the advent of the nineteenth dynasty the innovations foreshadowed in the columns of Tell-el-Amarna, and already suggested in the columns of Amenophis III, became more marked, and after the building of the temple of Goornah (or Koornah) the use of the cylindrical instead of the bundled shaft becomes general. The short reign of Ramses I, the first king of the nineteenth dynasty, was followed by that of his son, the great Seti I, the builder of the temple of Abydos and of the great hypostyle hall at Karnak. The temple at Goornah, begun under Ramses I and completed by his son and his grandson, Seti I and Ramses II, is perhaps the first temple after the work at Tell-el-Amarna in which this innovation is followed up, but with somewhat more regard for earlier traditions. The lotus-bud columns of its portico are of the bundled type, in general form similar to those of Amenophis III, but with nine stems in the grouped shaft. Those of the hypostyle hall, on the other hand, have cylindrical shafts, built, not in drums, but in courses, and covered with stucco. The columns both of the portico and of the hall are of very squat proportions. These cylindrical shafts are covered with inscriptions, the desire for which doubtless played its part in producing the innovation.

During his long reign Ramses II showed himself a most industrious and ambitious builder, so that among existing remains probably more temples, in part or in whole, belong to his reign than to any other, while his inscriptions constantly usurp the buildings of earlier kings. Apart from his additions to other buildings and the rock-cut temples presently to be considered, the Ramesseum at Thebes is probably the most important of his buildings. The enormous number of the constructions of this time goes far to explain the fact that the columns of Ramses II are more carelessly constructed than previous work. Instead of being of regular drums they are in courses of smaller stones with poor joints, the irregularities of which the stucco covering was counted upon to disguise, while the mortar, which now for the first time came to be used in the joints, gave the necessary strength. The scale of the columns was often so great that they could hardly have been built in drums, and in some cases the shafts were built with a facing of cut stone filled with rubble in the centre. The traditional forms of the bundled shaft still furnished the motives for the decoration of the capital and the necking of the shaft, so changed however as no longer to suggest their origin in the imitation of natural form, and becoming a merely conventional, but appropriate, surface decoration for a column, which had been so far modified by its material as to retain nothing of its wooden origin but its outline.

Of all the buildings of Ramses II, by far the most interesting, and certainly among the most remarkable monuments of Egyptian architecture, are the two rock-cut temples at Aboo-Simbel (Ipsambool) in Nubia. They are not far from each other and are cut into the lower part of the sandstone cliffs which here come close to the river bank. The larger temple was dedicated to Ammon-Ra and to Harakteh the falcon-headed sun god, the smaller to the goddess Hathor and to Nefer-tara the Queen of Ramses II. The larger temple is fronted by four wonderfully impressive, colossal seated figures of the king, occupying the usual place of such statues in front of a temple, but here carved out of the living rock and engaged against the slightly sloping face hewn in the cliff to form the temple front, and representing a temple pylon crowned by the throat-moulded cornice. In a niche over the doorway is a much smaller figure of the god Harakteh. Against the façade of the smaller temple are carved six gigantic standing figures, three on each side of the entrance, the central figure in each group representing the queen while the side figures are portrait statues of the king. They are accompanied by smaller figures of their children. The seated colossi of the temple of Ammon are sixty-eight feet high, the standing figures of the Temple of Hathor thirty-three feet. Both fronts are richly decorated with hieroglyphic inscriptions and low reliefs, which, especially in the larger temple, are of exquisite execution.

The general scheme of plan is, in each of these grotto temples, similar to that of the constructed temples, but simplified — especially in the smaller — on account of the difficulties of rock excavation. In spite of these difficulties however the size is imposing. The total excavation of the larger temple from the threshold to the back of the innermost chamber is one hundred eighty feet in depth. The roof of the great hall of the interior is supported by piers, against which are engaged standing figures of the king. This type of pier is called the Osiris pier because of the frequency of representations of this god in this position.

Ramses II had several similar temples hewn in the rock in this region, of which that of Gerf-Hosein stands next in importance.

In the twentieth dynasty a still further loss in artistic quality and delicacy of form is to be noted, especially in the

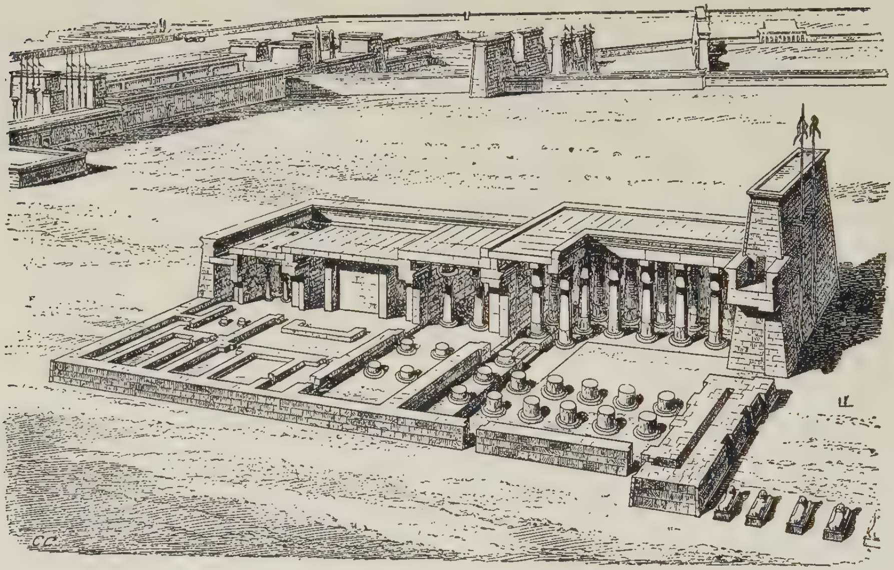


FIGURE 14. THE TEMPLE OF KHONS.
From G. Perrot and C. Chipiez' "Art in Egypt" (1883), Vol. I, Fig. 208.

treatment of the columns, which are similar to those of Ramses II, but even less well executed, heavily and poorly proportioned. Ramses III, the first king of the twentieth dynasty, was, like his earlier namesake, a great builder. The columns of the temple of the god Khons, which he built within the enclosure of the great temple of Karnak, illustrate the type of column of this period. Heavily and clumsily proportioned as they are, depending for any delicacy of detail entirely on the stucco covering, and lacking in the beauty which characterizes earlier columns, one quality they have gained: they are in better harmony with their material. They are distinctly columns of stone. But the temple of Khons is chiefly remarkable as affording a quite complete and characteristic example of the general arrangement of the Egyptian temple of the Empire. Built as this was by a single monarch (for although decorated by his successors it was never added to), its plan may be taken as the type of the temple of this period (Figure 14).

It will be noted that the temple consists of the following elements: The façade is formed by two great pylons between which is the lofty, lintel-spanned doorway, crowned by the throat-moulded cornice; entering one finds oneself in an open court surrounded by colonnades, which in this case are double and on three sides; beyond this is the hypostyle hall. Penetrating still farther, one reaches the shrine, surrounded by a corridor which gives access to various small chambers. In the extreme rear is the processional hall. The solemn interior receives less and less light as one penetrates its mysterious recesses, and the height and size of the courts and halls grows less as one approaches the sanctuary. It has been suggested that this scheme of arrangement was due to the custom of the Pharaohs of adding to early temples of modest size, by building their additions almost always in front, making them larger and more imposing to outdo their predecessors. Gradually this came to be the accepted mode of composition, hallowed by tradition and used for all temples of importance.

It must be noticed further, as important characteristics of the normal temple plan, that the scheme is symmetrical. The main entrance is in the centre of the façade and all the main doorways connecting the courts and halls are carefully placed on the axis of entrance. On the other hand the length of the great monumental halls always in Egypt extends at right angles to this main axis of entrance. Their main doorway is always in the middle of one of the long sides. In some cases these great interiors show much the same peristylar conception as the courts. A marked example of this is found in one of the halls of Thothmes III in the great temple of Karnak (Figure 15). The roof of this hall is carried by four rows of columns consisting of a peristylar arrangement of square piers with lotus columns in the centre. The shrine itself, however, always has its length in the direction of the axis of entrance and until Ptolemaic times has a door in both the narrow ends. As in the case of the "Temple of the Sphinx" the plan of the whole is therefore essentially T-shaped, though enclosed in a rectangle, place being thus formed for the minor apartments. In this way an organic whole of numerous apartments, halls, and courts is formed, carefully grouped about axes. Variations from this normal type and especially irregularities of planning where they occur are due to peculiarities of site, or to additions of various epochs.

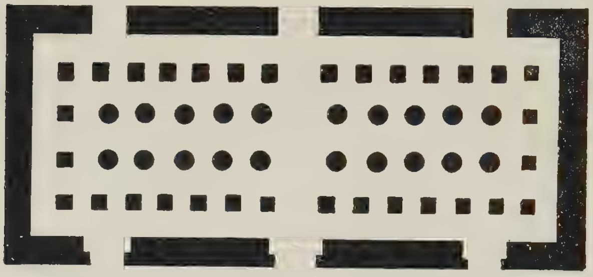


FIGURE 15. PLAN OF THE PROCESSIONAL HALL OF THOTHMES III AT KARNAK.

From G. Leroux's "Les origines de l'édifice hypostyle" (1913), Fig. 49.

One of the most noteworthy of the many important works of this reign is the unique gateway, which, under the name of the Pavilion of Ramses III, forms the entrance to the precincts of the temple now known as Medinet-Aboo, which he built at Thebes on the west bank, to the south of Hatshepsu's rock-cut temple. The two towers of this gateway are almost square in plan and have hardly any appreciable batter. They are surrounded by battlements of semicircular form such as were used in fortification towers, and contain windows just such as were doubtless common in the palaces of the time, and which are found represented in the wall drawings.

The development of Egyptian architecture seems to be summed up in the most stupendous building which its art produced, the work to which from the time of the Middle Kingdom onward all the great dynasties contributed, the great temple of Karnak already referred to (Figure 16). The oldest portion belonged to the Middle Kingdom, but the remains of this period have almost entirely disappeared. It was already at this time a large temple. Thothmes I built in front of it a great court surrounded by colonnades and statues, and entered through a great pylon (V in plan). Later he built in front of this a second still larger pylon (IV) with a colonnade between the two. Queen Hatshepsu built a series of apartments within the court of Thothmes I and between the two pylons of her father set up two obelisks. These were ninety-seven and one-half feet high and were crowned with pyramidions of pure gold. Her jealous brother, Thothmes III, built a smaller pylon (VI) within the others, reconstructed some of the work of Thothmes I, and surrounded Hatshepsu's obelisks with walls in order to hide them. Finally, in the rear of the old temple, he built, as above described, a great processional hall with adjoining apartments, among them the hall with the sixteen-fluted columns already spoken of. Amenophis III built yet another and larger pylon (III) in front of the outer gateway of Thothmes III, leaving a narrow court between the two. The nineteenth dynasty undertook still larger constructions. Ramses I built at a distance of some one hundred sixty

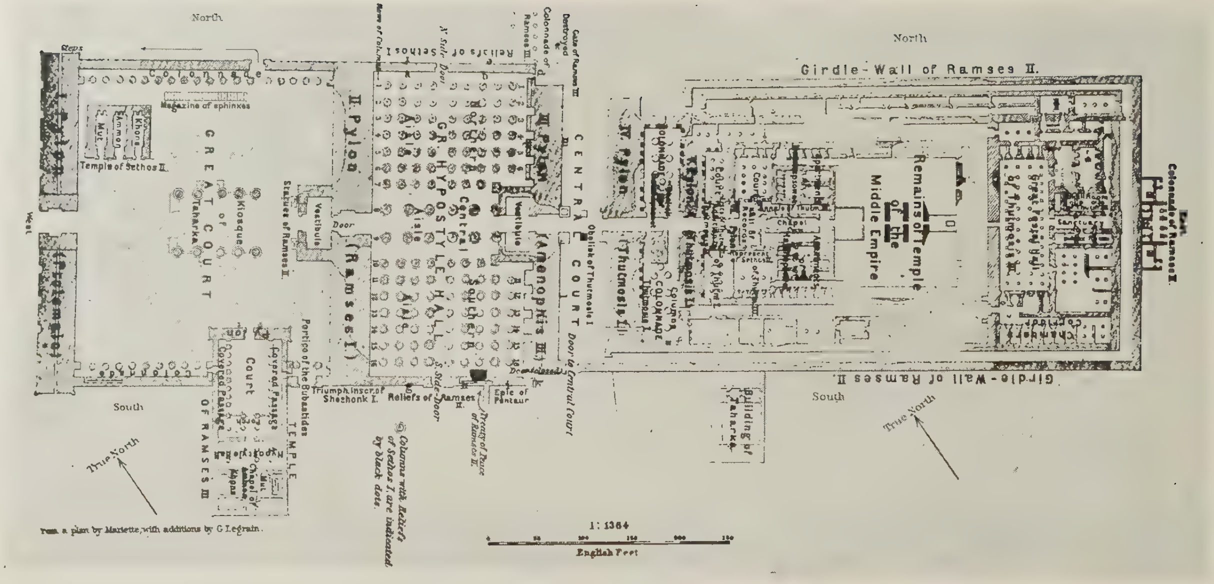


FIGURE 16. THE GREAT TEMPLE OF AMMON AT KARNAK.

From Baedeker's "Egypt" (1914).

feet in front of the entrance of Thothmes III a new pylon (II) which surpassed all the others, making a façade of about three hundred forty feet in width, and he enclosed the whole of the temple thus formed by an outer wall. Occupying the whole of the court formed between these last two great pylons, Seti I began and Ramses II completed that great hypostyle hall, — the largest hall in the world whose stone roof is supported by columns, — which more than anything else gives to the temple of Karnak its reputation as one of the wonders of the world (Figure 17).

The size of the hall (three hundred thirty-four feet by one hundred sixty-seven feet) will be realized when one notes that the plan of Strassburg cathedral with its length of three hundred twenty-four feet and transept spread of one hundred fifty feet, could be inscribed within it. The hall is divided into two halves on the central axis of the temple by two ranges of colossal columns with campaniform capitals, forming a wide central aisle with six great columns on each side. These columns, the largest ever used to support a roof, are eleven feet and eight inches in diameter and sixty-eight feet and ten inches in height to the under side of the architrave, and lift the roof to a height of seventy-five feet above the floor. The great bell-capitals have a spread of twenty feet, and it has been estimated that forty-two people could sit on the lip of one of them. On either side of these great columns are ranges of shorter lotus-bud columns closely set, one hundred twenty-two in all. The first row of these, on each side of the central aisle, carries a wall which reaches to the height of the architraves over the great columns. This wall is pierced with windows, forming a clearstory to light the interior. It is the first extant example of an arrangement which re-

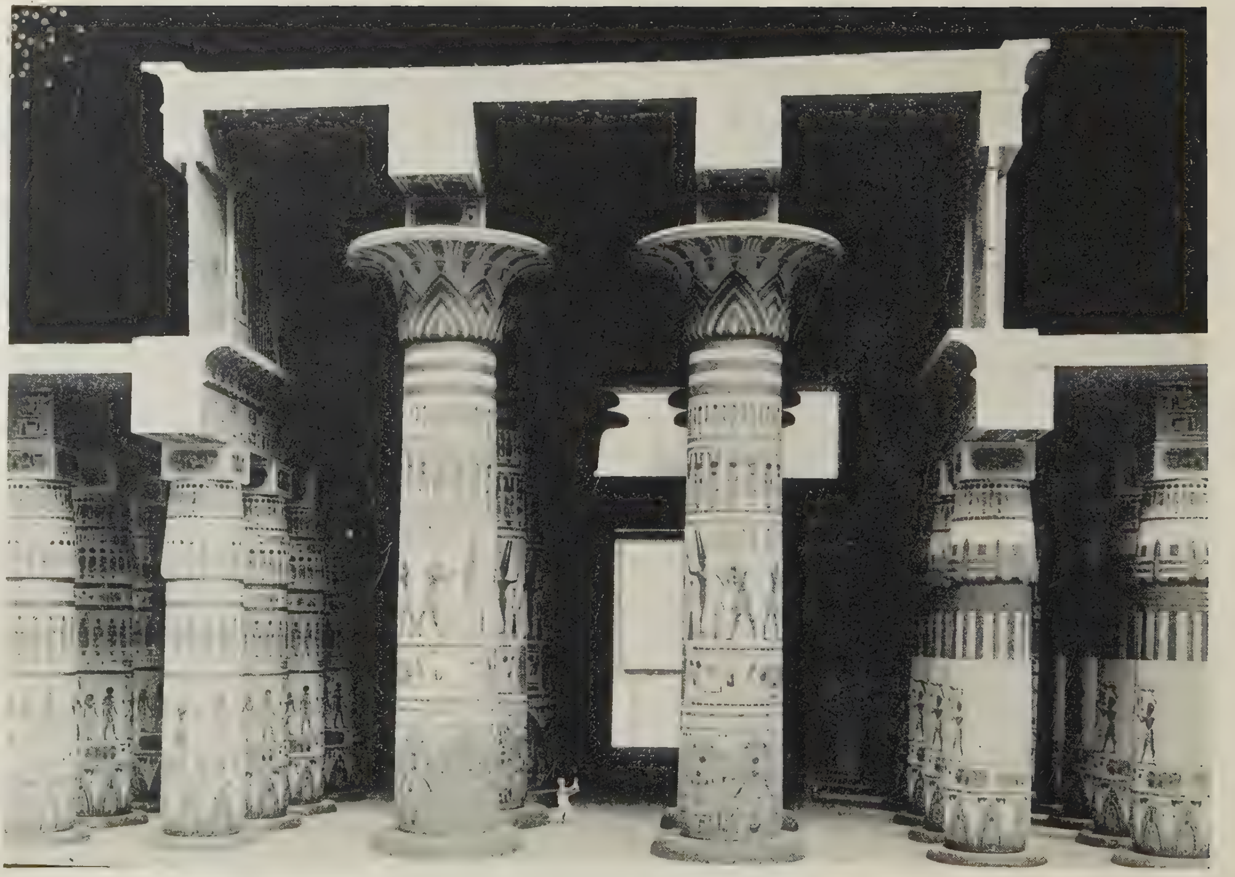


FIGURE 17. CENTRAL AISLES OF THE HYPOSTYLE HALL AT KARNAK.

From the restored model in the Metropolitan Museum.

appears in Roman basilicas and so passes into the scheme of the Christian church, of which it is one of the most striking and familiar features. Huge as these windows are they are filled with grilles of granite, which clearly simulate on a colossal scale the wooden screens of windows in private houses. The rock-cut tombs and sarcophagi, and the wall-drawings, show screens of similar form.

Some of the columns of Seti I are good examples of what may be regarded as the culminating form of the lotus-bud column. As already pointed out, they have lost the delicacy of feeling of the earlier work, but they are excellently proportioned, the decorations although stiff and conventional are appropriate, and their form is more nearly suited to the material and more expressive of the function of support than that of earlier columns. Most of these columns erected by Seti are disfigured by the coarse inscriptions of Ramses II. The great columns with bell-capitals are of superb outline and proportion, but the capitals have no constructive function. They are purely decorative. The abaci above them are actually of less diameter than the upper diameter of the shaft — and seem to form no part of the capital but constitute an inconspicuous and apparently unimportant adjunct above it, and yet they are the real bearing members, the true abaci.

In front of the hypostyle hall and the pylons of Ramses I the Libyan kings of the twenty-second dynasty built an enormous court in which Tirhakah the Ethiopian of the twenty-fifth dynasty set up columns as if in rivalry with the campaniform columns of Seti I; but they were set so far apart that no architraves of stone could be found to span them. This court enclosed a small shrine of Seti II and a temple of Ramses III which stood outside the temple of the time of the nineteenth dynasty. The Ptolemies undertook to build great pylons (I) as the entrance to this court, but these were never entirely completed. The huge temple thus came to have a total length of some twelve hundred feet.

Meanwhile a series of great courts with pylons had been built on the side of the temple by Hatshepsu, Thothmes III, and Horemheb, forming a side approach to the narrow central court between the third and fourth pylons, and the whole precinct was surrounded by an encircling wall which enclosed a space measuring about eighteen hundred feet by fifteen hundred feet and which included within it, besides the great temple of Ammon and the temple of Khons, nine other temples or shrines.

Near the centre of this court and outside of the great temple was a sacred lake of rectangular form, some four hundred feet by two hundred eighty feet in size, surrounded by walls. The great space about it was doubtless laid out as gardens with avenues of palms and other trees. From the side courts an avenue of sphinxes led to the enclosure of the temple of Mut with its sacred lake, while from the great portal of the enclosure which fronted the temple of Khons, another avenue of sphinxes led to the temple of Luxor nearly a mile and a half away on the river bank. These avenues were doubtless also bordered with trees. Many other temples with their courts were in the neighborhood, including many smaller shrines of very simple plan and arrangement. When to these temples we add in imagination the palaces of the kings and of the nobles, with their courts and gardens laid out in formal lines with groves and pools; the tree-bordered irrigating canals, on the banks of which the houses were often built; the great storehouses; the public squares; gayety of color everywhere; the movement of brilliantly decorated barges on the river; of vessels laden with merchandise; and across the broad stream the necropolis with its temples and tombs and its great lake, we are able to form some dim conception of the majesty and somewhat barbaric beauty of ancient Thebes.

The character of these palaces of the kings and their courtiers, with their courts and formal gardens, their pools and pavilions and the more modest houses of their dependents, is clearly shown in many of the wall-drawings, especially those of Tell-el-Amarna, and is further illustrated by the forms of sarcophagi and of rock-cut tombs, and by models of houses that have been preserved. The palaces and houses were built of sun-dried brick and covered with stucco. The columns may have been built up in the same fashion, or during the Middle Kingdom of burnt brick. Whatever their material, when covered with stucco and decorated with color, their aspect must have been similar to those of the stone columns. In slighter construction wooden columns or posts doubtless continued to be used. In the palace at Tell-el-Amarna remains of columns of enamelled brick have been found.

The color decorations of houses, tombs, and temples, which thus far have only been incidentally referred to, must be examined more closely, since from many of the designs and patterns used were gradually evolved the characteristic decorations of later architectural styles.

In general character, and in certain fundamental principles, Egyptian color decoration has a certain resemblance to that of the Japanese. It is laid on in flat or nearly flat tints without light and shade, but it is even simpler than the

Japanese in the palette used, and the tints are more vivid. There was apparently somewhat more variety of color in the Empire than in the Old Kingdom. Yellow, red, blue, green, brown, white, and black were the colors employed in bright tones, several — always flat — tones of each color being in use. The simpler wall decorations were of those geometric patterns based on the checkerboard, which resulted from the imitation of weaving and which are found among nearly all primitive peoples. These checkerboard or lozenge patterns were enlivened by the use of the rosette, the star-flower, and especially by spiral patterns, or by the square spiral usually known as the Greek meander, because of its frequent use by the Greeks at a later time. It is clear that these patterns reproduced on the wall by painting the patterns of the woven stuffs, the rugs, and tapestries with which the walls of houses were hung. In many, especially the more elaborate, of these patterns conventional representations of the buds and flowers of lotus and papyrus constantly appear. Such wall patterns are constantly surrounded by terminal borders, and these borders frequently take a form which suggests very obviously their derivation from the tassels into which the ends of the threads of textiles were tied to prevent their unravelling, a charming decoration thus resulting from the process of the handicraft. The idea once suggested, the painted borders were elaborated in intricate forms which the tasselled fringes of rugs could never have assumed, and in these the conventionalized forms of the lotus and the papyrus, both flower and bud, play the most prominent part.

The most frequent type of this pattern is formed by alternations of lotus flower and bud connected by lines, often curved, and sometimes suggesting the stems of the plant

(Figure 18). These border patterns are endlessly varied, and are often further modified by association with rosettes or spirals. Borders of this type are called by the obvious name of *lotus-flower and bud* patterns. They are of very great importance in the history of art as they underlie several of the most usual Greek decorations which, especially as modified by Roman and Renaissance designers, are to-day among the most familiar of decorative forms.

The vertical wall was often subdivided, the lower part or base taking the form of a broad band, the *dado;* while the top of the wall is often finished off by a narrower band known as the *frieze.* We thus get already in Egyptian art the suggestion, at least, of the subdivision so common in later times of "dado," "wall-veil," and "frieze."

The subdivision of the Egyptian wall is often symbolic, suggestive of the earth with its plants and the overarching sky. The dado thus takes on the representation of the rushes, es-

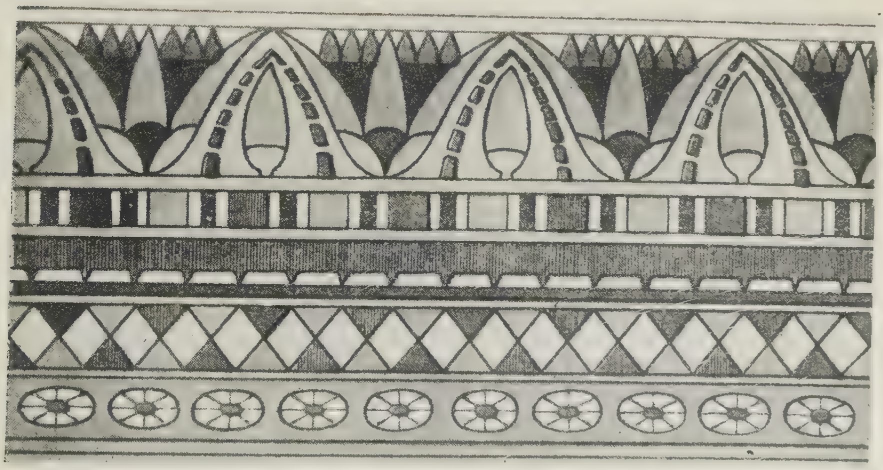


FIGURE 18. BORDER OF LOTUS FLOWER AND BUD.

pecially the papyrus, the vertical lines of which are particularly appropriate as a decoration for the base of the wall. Sometimes the water, out of which the reeds grow, is represented by zigzag lines to indicate waves, which thus form an appropriate border near the floor. The ceilings are often blue, and studded with stars, accompanied often by the vultures of Mut with horizontal outstretched wings, or the similar forms of the winged solar disk, the lines harmonizing and sometimes coinciding with the horizontal ceiling slabs.

Nearly all these decorations obey more or less clearly the fundamental law of harmony which requires that there shall be a close relationship between the form of the decoration and the form of the thing decorated. This principle seems to have been dimly felt rather than clearly apprehended by the Egyptian artist. We shall find the Greek clearly recognizing it as a fundamental principle of all decoration. But in the vertical lines of the decorations of the bases of Egyptian column shafts, of the dados, of the throat-moulded cornice; in the horizontal lines of many ceiling decorations or of the winged disk over the doorway; in the curved lines of the leaves which adorn the lotus-bud capitals and the bell-shaped capitals, we see already the application, if not the clear recognition, of this law.

Following the decline of Egyptian art during the dynasties after the nineteenth, there was under the twenty-sixth dynasty, just before the Persian domination, under several Pharaohs by the name of Psammetichus, a remarkable revival of Egyptian art which has sometimes been referred to as an Egyptian renaissance. This revival continued, subsequent to the Persian rule, under the restored native dynasties, particularly under the last native monarch Nektanebo II who built some of the important structures on the island of Philæ near Asswan.

The great period of the Ptolemies which followed the death of Alexander the Great is little more than a continuance of the rich style of the last native kings. Although some evidence of the modifying influence of late Greek art is to be noted, the striking fact is that this influence is so slight. It shows itself in a certain rich exuberance of taste rather than in any marked changes of detail. Egyptian art still remains thoroughly and uncompromisingly Egyptian.

Side by side with this purely Egyptian art, to be sure, there is evidence that buildings purely or almost purely Greek were built, especially at Alexandria, and there is evidence also of a certain commingling of the styles, as in buildings Egyptian in plan but Greek in detail. Such structures are, however, of only local importance, and the evidence of their character is scanty.

The most marked change in the purely Egyptian architecture is to be noted in the treatment of the column. The campaniform and palm-leaf orders are the favorite. While the latter is hardly changed, the bell capital now breaks up into numerous leaves and scrolls, carved in relief, as well as richly decorated in color (Figure 19). The shaft remains simply cylindrical save that above, and sometimes immediately below, the banded necking the bundled shaft is recalled, but now the elements of the bundle are slight, like veritable reeds, and the whole treatment tends toward a certain naturalism while still remaining conventional. The capitals are of great variety and this enriched form of campaniform capital, the bell cut up into distinct lobes, is often used side by side with the palm-leaf capital, a juxtaposition which would not have been tol-

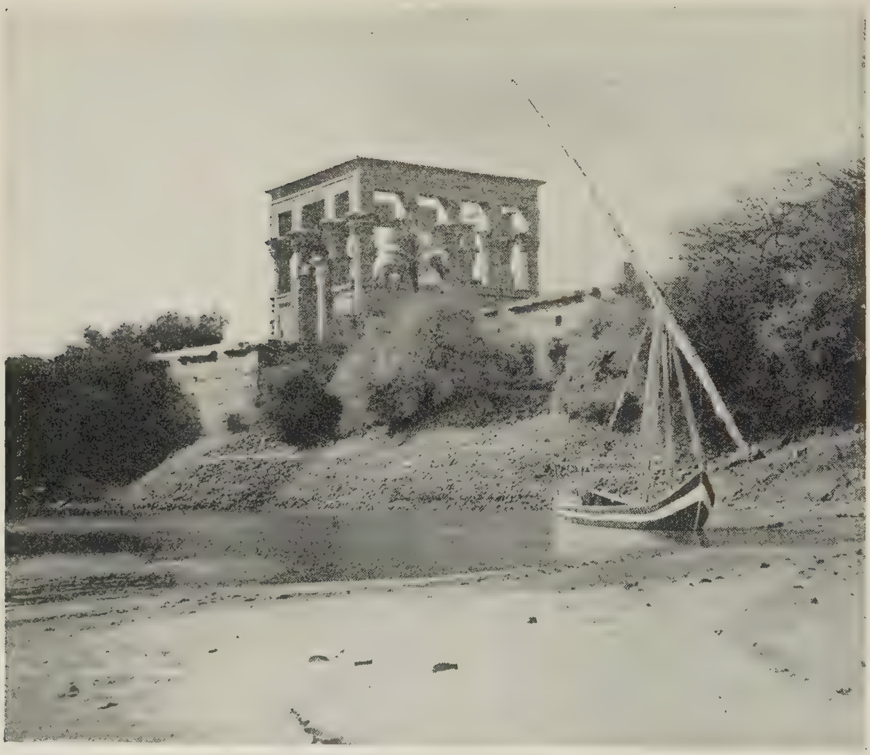


FIGURE 19. PAVILION AT PHILÆ.

erated in earlier periods, when if two orders were used in the same portion of a building, it was to emphasize a central aisle, or corridor, in a great colonnaded interior. The love of variety for its own sake is now clearly apparent.

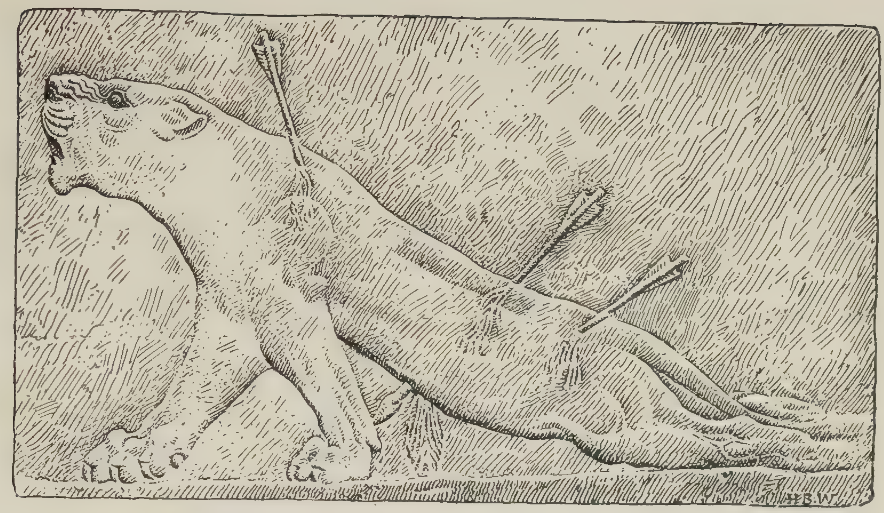
In plan we find that the hypostyle hall, instead of being lighted by the clearstory or some similar device, has an open colonnade taking the place of the front wall. This colonnade is blocked by a screen wall rising to one third or nearly one half the height of the columns. The skylight is also used as at

Edfoo. The inner shrine of the temple now takes the form of the Greek cella, having but a single doorway on the front narrow end.

To this period belong the largest number of extant Egyptian temples, such as those of Edfoo, of Kom-Ombo, of Esneh, of Deir-el-Medineh, of Denderah, — some of them, like Denderah and Esneh, completed or enlarged under the Roman emperors, under whose rule the Egyptian style underwent no appreciable change.

The completeness of the temple of Edfoo makes of it one of the most impressive of the Egyptian remains; but the most beautiful of all the buildings of this period and distinctly the most picturesque example of the architecture of ancient Egypt were the buildings on the island of Philæ near the first cataract (Figure 2), now hopelessly submerged beneath the waters held back by the great modern dam of Asswan, which has brought increased fertility and prosperity to Egypt, but has destroyed one of the most interesting groups of buildings of all time. The buildings are the work of Nektanebo, of the Ptolemies, and of the Cæsars. The beauty of the colonnaded courts, the great pylons, the temple porticoes and pavilions, was greatly enhanced by their situation on this island, five hundred yards long, set in the midst of the stream which mirrored the temples and the luxuriant setting of palm and tamarisk, while the great colonnaded halls were among the most beautiful and complete examples of Egyptian color decoration as applied to architectural form.

Perhaps at no time in the history of the world has any land shown such solemn richness of beauty as Egypt during this luxurious period, when so much of the more austere art of the earlier ages till remained. From the delta to the first cataract and beyond, and in the Fayoom, was one succession of mighty cities, with majestic temples, pleasant groves and parks, great palaces and houses set in their walled gardens along the tree-bordered canals; all this splendor relieved against the huddled dwellings of the poorer classes, doubtless not unlike those of an Eastern city at this day. Between the cities were villages along the river bank, with their simple huts embowered in palm trees, and outside of them the cultivated order of the fields, while always as the stern background to this scene of richness and of life were the bare, rugged, flat-topped hills of rock, or the parched sandy desert stretching limitless to the horizon, bordered by the tombs of the dead, and with the huge pyramids lifting their solemn heads to the sky as they lift them to this day.



From a drawing by Harold B. Warren.

II

MESOPOTAMIA

Besides Egypt another of the most ancient civilizations of the near East contributed important elements to the subsequent development of the architecture of Europe. This was the civilization of Mesopotamia, the great plain-country lying about and between the rivers Tigris and Euphrates which, rising in the mountains of Armenia in numerous streams which at the source lie often close together, separate until they are about two hundred miles apart, and then flow converging in a southeasterly direction until — in most ancient times as separate rivers, but now united — they empty into the Persian Gulf.

There are many analogies in the physical conditions of the two regions. Like Egypt, Mesopotamia is dependent for its fertility on the rivers; but instead of a single great river

Mesopotamia is watered by two mighty streams with their tributaries. As in Egypt also that part of the country near the mouth is the creation of the rivers themselves, the alluvial deposit of the ages. In Mesopotamia as in Egypt there is little rain — during the greater part of the year none at all. As in Egypt therefore the roofs of houses are flat. Both countries have a hot tropical climate. But unlike Egypt there are in Mesopotamia, in the winter season, heavy torrential rains whose floods as they subside produce rapidly a rich and abundant vegetation, which grows up only to be parched to barrenness by the burning heat of summer. In ancient times, however, much more than now, the country was everywhere kept fertile by an irrigating system. Indeed ancient Babylonia was probably more fertile than any other ancient land, even than Egypt, and was especially fruitful in wheat and other grains. This was the basis of its great wealth and prosperity.

In contrast also with Egypt stone was not easy of access. Instead of the abundant supplies close to the river bank found everywhere in Egypt above the delta, Mesopotamia is without stone save in the extreme north of the country, especially along the upper reaches of the Tigris. It had therefore to be transported long distances. More strikingly even than was the case in Egypt, civilization began in the alluvial plains about the mouths of the river and slowly pushed its way northward. During the earlier history of the country, therefore, when its methods of construction were forming and becoming fixed, stone was almost inaccessible, to be had only by penetrating the hostile and uncivilized northern region. The apparently limitless plains of the south, where the civilization of Mesopotamia took shape, being then without stone, when durable structures came to be demanded a substitute had to be discovered. This led to the invention of the art of burning brick. In striking contrast therefore to Egypt Mesopotamia is a brick-using, not a stone-using, country. The whole character of its architecture is dependent upon this fact. In order to span great spaces in the absence of the lintel of stone the Mesopotamians were led to invent and use the arch and the vault of brick. As in Egypt the form of the architecture is strikingly the outgrowth and expression of the natural conditions.

The country falls naturally into two great halves: the southern alluvial plain of Babylonia, and the northern region of Assyria, which largely borrowed its civilization, and especially its arts, from the south. Assyria may be said to begin where to the northward the absolutely flat alluvial plain of Babylonia gives place to the somewhat undulating steppes of slightly greater elevation, still without stone except where, in the north, the country is covered by ranges of low hills, or where, still nearer to the source, the foothills of the mountains of Kurdistan border the left bank of the Tigris.

The history of the country in earliest times is as yet less well known than that of Egypt. But its broad outlines may be discerned. Excavations and the interpretation of inscriptions are more and more proving that civilization in Babylonia began at almost if not quite as remote an epoch as in the valley of the Nile. The population seems to have been partly Turanian, in a people we now call Sumerians, and partly Semitic. In the course of time the population became largely Semitic in character throughout the whole of Mesopotamia.

In the earliest, Sumerian, epoch there seems to have been no dominant ruling power, but the country was cut up into a series of independent principalities or city states. The Sumerians had already reached a high degree of civilization, which was later absorbed by their conquerors and formed the foundation of the subsequent civilization of the valley. The fertility of their fields was increased by an elaborate system of irrigation. Their sculpture and pottery show considerable skill, and they had invented the cuneiform writing which continued in use in Mesopotamia during the whole of ancient times. Already they knew the art of burning bricks, and because of the absence of stone and the scarcity of timber the apartments of their buildings had taken on that long and narrow form which they were to preserve throughout the ages, in order that the spans might be short enough to be easily covered.

After the Semitic conquest the country was at last united under the rule of Sargon, king of Akkad, who about 2675 B.C. established the first of the great empires which were to rule in this land, for he conquered not only the whole of Mesopotamia, but also Elam, Armenia, Syria, and Arabia. The people of Elam, whose seat was in the mountainous regions to the east, were constant rivals of the people of the plain, and the successors of Sargon were overthrown by this hardy and warlike people about 2180 B.C. The Elamite rule was followed by a revival of Babylonian power under Hammurabi, who has left us a series of remarkable inscriptions in phonetic cuneiform characters, which give us a strangely vivid picture of the civilization of the time.

The first epoch of Babylonian rule was interrupted by the invasion of Mesopotamia by the Egyptians under Thothmes III, which brought a decided Egyptian influence, affecting especially the character of the decorations, and which in turn influenced Egypt, bringing to the Egyptians improved methods of fortification building and the art of burning brick, together with the Mesopotamian methods of vault building as illustrated in the substructures of the Ramesseum at Thebes.

The Egyptian influence was followed by the rise of Assyrian power. The Assyrian Tukulti-Ninib I effected the conquest of Babylon about 1275 B.C. But the south was constantly restive under the despotic and cruel Assyrian rulers. The least slackening of military prowess led to revolts, yet about a century and a half later Tiglath Pileser I, one of the greatest of these ruthless conquerors, again overthrew Babylonia and added Syria to his empire. After the death of his two sons Assyria for a time declined and Babylonia recovered its independence if not its supremacy. Tiglath Pileser II and again Tukulti-Ninib II revived the Assyrian predominance at the beginning of the ninth century B.C. and from this time on for some three hundred years Babylonia, though not without repeated rebellions, remained subject to the Assyrian power. The long line of monarchs that followed, many of whose names are associated with the palaces they built, and which modern research has uncovered at Nimrud and Nineveh, were able to extend and to preserve their empire only at the expense of constant warfare.

The last line of Assyrian kings was founded by another Sargon (B.C. 721), the great conqueror whose palace and city at Khorsabad are among the most important of Assyrian remains. His son and successor Sennacherib, the builder of a palace, — one of several unearthed by Layard, — at Koyundjik, invaded Judæa (2 Kings xviii. 9, xix), crushed rebellions in Babylonia, and began the conquest of Elam.

Esarhaddon (or Assur-haddon) is the next of the line. As in the case of so many of the Assyrian kings, the chief element of his name, Assur, is the name of the chief god of the

Assyrians, their guiding genius, the personification as it were of their race, the god who gave them their success in battle. Assur-haddon conquered northern Arabia, and even attacked Egypt, then under the rule of Tirhakah the Ethiopian, repeatedly taking and retaking Memphis and Thebes. The greatest extent of the vast empire was reached when the next king, Assurbanipal (the Sardanapalus of the Greeks), completed the conquest of Elam; but the great Assyrian power was already stooping to its fall. There was a general insurrection of the conquered peoples. Egypt freed itself, and during the reign of Assuredelani Babylon under Nabopalassar successfully revolted. In the reign of Sarakus Nineveh was destroyed by the Medes and Babylonians. Assyria then passed under the rule of the Medes, while to the south the ancient power and splendor of Babylon was for a time revived under Nebuchadnezzar and Nabonidus. But the predominance of the Medes now gave way to that of the Persians, less civilized than the Mesopotamians, but at this time having the rugged strength of hardy mountaineers. Under Cyrus the Persian Babylon, then under the immediate rule of Belshazzar, was taken (B.C. 536). The Chaldæan power was broken, as the Assyrian had previously been, and the great empire of Babylonians and Assyrians passed under the rule of the Persian conqueror.

In spite of the violent changes and fluctuations of this long history, the civilization of Mesopotamia like that of Egypt has a distinct unity of character which is reflected in its arts. The history of its architecture falls naturally into three great epochs, the earlier Babylonian period before the Egyptian invasion, the Assyrian period, and the second Babylonian period following the overthrow of the Assyrian power.

The second Babylonian period seems to show characteristics strikingly similar to the first, and what is known of its building throws light on the character of the work of the earlier epoch. The two may therefore, for the purpose of this survey, be considered together.

The disturbed history of Mesopotamia, the restless and relentless warfare constantly carried on over its vast plains, gave exaggerated importance to the military power of kings and chieftains. It is not surprising therefore to find the fortress palace of the king taking on a relative significance in the history of the architecture of these regions even greater than that of the temples, the contrast in the history and conditions of Egypt and of Mesopotamia being thus expressed, not only in the character of the architecture, but in the very problems which it deemed of greatest importance. This was especially true of the period of Assyrian predominance, when the temple tended to become less and less important, while the utmost constructive skill and richness of decoration was lavished upon the palace of the king.

Not only for the sake of strength, but in order to lift them above the floods and vapors of the level plains, the palaces were constructed on huge platforms. The lack of stone deprived these buildings of the use of the colonnade (so important an element in all other ancient architecture) except for porticoes of wooden columns which seem to have been built on the flat roofs of the palaces as a pleasant shelter from the sun, or occasionally in the similar construction of small shrines. The massive walls of sun-dried brick, protected with burnt-brick facings and probably in some cases intended to carry vaults, gave to this architecture a heaviness of character which its rich decoration could but partially soften.

Perhaps the earliest of these palaces, thus far known, is that discovered by M. de Sarzec in the extreme south of Chaldæa in the ruins of a city otherwise unknown. The walls are of burnt brick laid with bitumen for mortar. Each brick bears on its upper surface the name of the *patesi* or chief Goudea with a formula of consecration to the local god Nin-Ghirsou. The platform on which it is built rises to a height of nearly forty feet above the plain and forms a parallelogram of about one hundred feet by one hundred seventy-five feet. In Chaldæa, bitumen, lime mortar, and mud with chopped straw were all used for mortar from the most ancient times. Stone when employed was usually laid without mortar. The palaces of later time built by Nebuchadnezzar are identical in general scheme and architectural character with those of Assyria, and since in the main this seems to be also true of the earliest Chaldæan palaces, we may assume that in most important respects the palaces of Assyria of the ninth and eighth centuries were similar in character to those built in Babylonia a thousand or two thousand years before that time.

The temples also seem to have maintained throughout this long period the same general character, but the later Assyrian were smaller and less important than the earlier Babylonian temples. Those of the Babylon of Nebuchadnezzar seem however to have more than rivalled in size the more ancient examples. Of the temples the oldest known is that of Nippur, excavated by the expedition of the University of Pennsylvania between 1889 and 1900.

The main feature of the Babylonian as of the Assyrian temple is the ziggurat or stage-tower, a species of observatory in the form of a stepped pyramid, its stages usually so inclined and connected as to afford a continuous inclined plane encircling it and giving access to the summit. Of these towers there were usually one, sometimes two, to each temple. Connected with and preceding the ziggurat were chambers and shrines surrounding a court. The ziggurat of Nippur surmounts an artificial platform measuring roughly one hundred ninety-two feet by one hundred twenty-seven. As is usual in Mesopotamian architecture, both for palaces and temples, the four corners are placed toward the four points of the compass. The tower is in three stages. The building is of several periods. Lime mortar, mud cement, and bitumen were all of them used at Nippur.

One of the most interesting temples thus far described is the temple of the gods Anu and Adad at Assur (Figure 20). The gods of the Chaldæans and Assyrians seem to have been conceived as spirits benign or maleficent, awful and terrifying beings who had to be propitiated. Every object of nature was inhabited by some god or demon. The sun, the stars, the heavens, the lightning, were especially the manifestations of the more important of these. The observation of the heavenly bodies and astrology played a most prominent part in Assyrian as in Chaldæan cult. To this perhaps is due the building of the remarkable observation towers or ziggurats. Of these the temple at Assur above referred to had two; one dedicated to the great god Anu, the god of the heavens, the father of the gods, the other to his son Adad, the god of the lightning and storm. The temple is of two distinct periods and although almost entirely rebuilt on its second construction, enough remains of the earlier work to show that the earlier form was in general similar to the later. The older temple owes its origin to Assurrisisi and to his son and successor

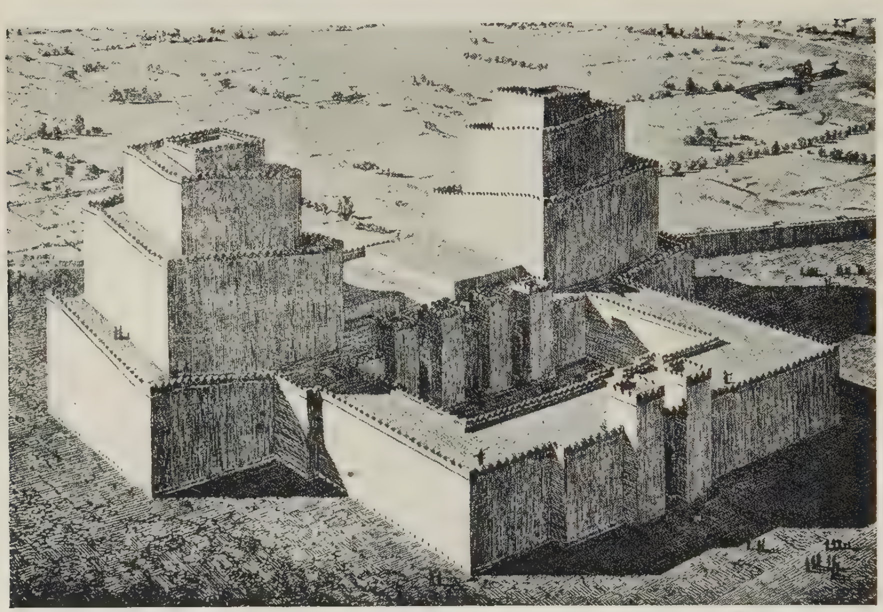


FIGURE 20. THE TEMPLE OF ANU AND ADAD AT ASSUR.
From W. Andrae's "Der Anu-Adad-Tempel in Assur" (1909).

Tiglath Pileser I. It dates therefore from the latter part of the twelfth century before Christ. The rebuilding took place under Shalmaneser (Salmanassur) II in the second half of the ninth century.

The most splendid of Mesopotamian temples was in all probability that built by King Nebuchadnezzar in Babylon. According to the descriptions of Herodotus this vast structure consisted of an enclosure measuring two stadia (about twelve-hundred feet) in each direction, within which was a stepped pyramid or ziggurat measuring one stadium (or about six-hundred feet) on each side. The ziggurat was in eight stages so arranged as to form a continuous incline surrounding each story of the pyramid and thus giving an approach to the summit. In the upper stage of the ziggurat was a great chamber within which was a richly furnished bed and a table of gold. In the court in front of the ziggurat was a sanctuary containing the huge golden statue of the god. Near to the statue was another great table and a throne also of gold, while in front of the sanctuary was a golden altar. The description accords, as to its general dispositions, with the form of temples recently explored in Babylonia and Assyria. The dimensions given are possibly exaggerated, but are not as great as those of the pyramids of Egypt. The actual present height of the Birs-Nimrud on the site of Babylon is given by Layard as two hundred thirty-five feet.

The Mesopotamian palaces of which the remains are most complete are those of Assyria; but, as we have seen, there is every reason to believe that in general style and character they followed the earlier Babylonian type. The ruined palaces of the Assyrian kings which were unearthed by Layard and his successors in the decade beginning in 1845 in the mounds of Koyundjik and Nimrud (opposite and to the south of the modern Mosul) yielded that wonderful series of alabaster slabs carved with low reliefs which bring so vividly before modern eyes the daily activities of the Assyrian kings, their armies and peoples, — sculptures which are now among the most remarkable treasures of the British Museum. These carved slabs formed the decorative facing of the lower part of the walls of the principal apartments of these palaces. Though in many respects conventional and somewhat awkward in the treatment of the human figure, these sculptures show in the representation of animal form a marvellous skill and a vivid and expressive naturalism which has seldom been equalled for keenness of observation and delicacy of execution. (Headpiece to Chapter II.) The remarkable development of sculpture, which the availability of limestone and alabaster made possible, distinguishes the Assyrian from Chaldæan work, although even here the Assyrian art is but a continuation and development of the earlier Chaldæan school. Sculpture in Babylonia was less employed, for the stone had to be transported great distances, coming sometimes from as far off as Egypt or Arabia; but the Babylonian low reliefs of earlier time, though less developed, show the same general characteristics as the later Assyrian.

The most complete example of an Assyrian palace and of an Assyrian fenced city that has come down to us, is the town and palace which King Sargon built about ten miles from ancient Nineveh. Having been absolutely the creation of this monarch, both city and palace are regular in plan, and show the ideal of an Assyrian royal residence. Its startling and epoch-making discovery in 1843 beneath the village of Khorsabad by M. Botta, the French consul at Mosul was the first of the long series of excavations in Mesopotamia. The discovery of Botta was followed in 1851 by the more complete excavation by Place and Thomas. Place mistook it for Nineveh itself. Like all Mesopotamian cities it is surrounded by a wall. The city lies four-square. Each side is a little over a mile in length, and the corners are placed characteristically toward the four points of the compass. The city wall is about eighty feet in thickness and in its present condition varies in height from forty-two to nearly fifty feet. Its exterior rests upon a limestone plinth and above this it is all built of crude brick. On each of the sides not occupied by the palace the remains of two gates were found.

Flanked by great towers, protected in front by a fortified court or barbican, and having a long entrance passageway interrupted by two narrow courts, these gateways are among the most remarkable of Assyrian constructions. They are of especial importance because they show us the Assyrian use of the arch and barrel vault. Some of them are richly decorated. The arched vault rests on the backs of great man-headed and winged bulls carved of alabaster, which are so characteristic a feature of Assyrian architecture. Seen in front the great beast stands squarely on its fore feet rigidly supporting the arch above. It is treated as if in full relief. Seen from the side it walks along beneath the overarching vault and stands out in low relief against the side of the slab. The creature is thus represented with five legs, a discrepancy which however is only noted when seen diagonally. These gigantic winged and man-headed bulls occur in most of the palace gateways also (Figure 21). In Sargon's palace at Khorsabad as many as twenty-six pairs of these great creatures, flanking the gateways, have been counted. The archivolt, or face of the arch, is ornamented with brilliantly colored enamelled tiles, the prevailing yellow figures of which are relieved against a background of blue. The decoration consists of winged genii alternating with rosettes. These decorated gateways were intended only for foot passengers, for they are approached both from within and from without by flights of steps. The gateways for vehicles and beasts of burden were left without sculpture, doubtless, as suggested by Perrot, because more liable to injury. Most of the gateways of the palaces are similarly — in some instances even more richly — decorated.

The palace itself is lifted up to the height of the city wall upon an enormous platform which projects both within and without the city on its northwest side, and measures about one thousand feet in extent (Figure 22). The clay in the shape of sun-dried bricks of which it is formed is faced by a retaining wall built of huge blocks of limestone, which at the base are six feet eight inches in height and thickness and nine feet long. It has been calculated each block must weigh twenty-three tons. The retaining wall diminishes gradually in thickness toward the top. The platform has a total height of about forty-three feet.

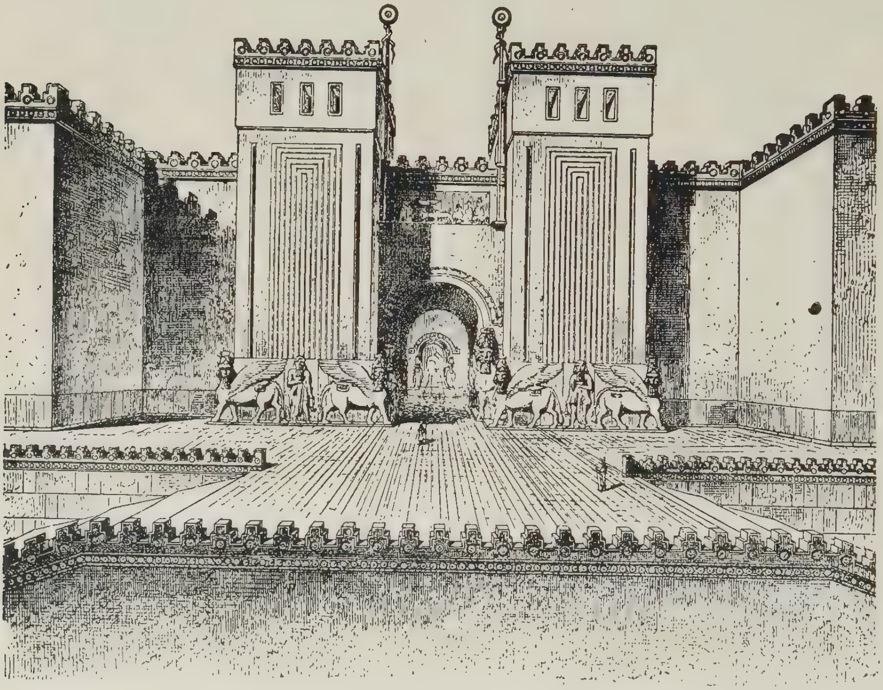


FIGURE 21. SOUTHEASTERN GATEWAY OF THE PALACE OF SARGON AT KHORSABAD.

From G. Perrot and C. Chipiez' "Art in Chaldæa and Assyria," Vol. II (1884), Fig. 5.

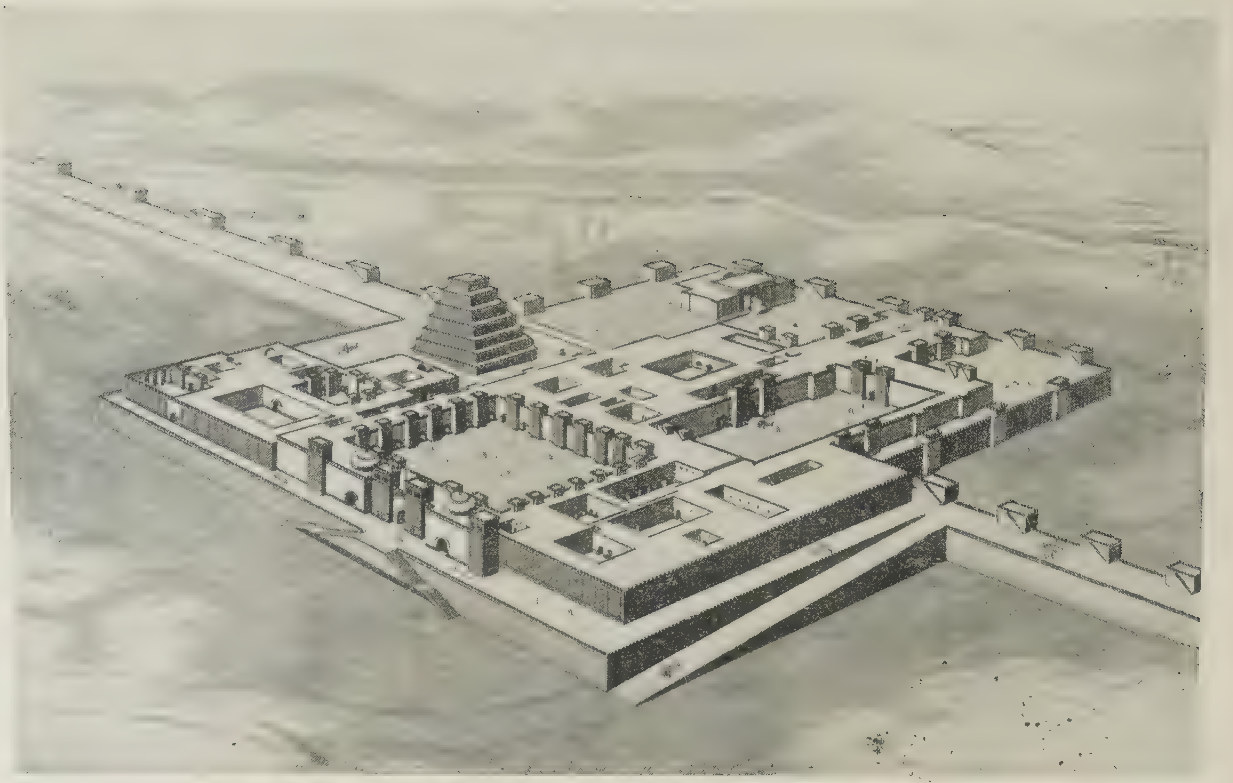


FIGURE 22. THE PALACE OF SARGON AT KHORSABAD, RESTORED.
From the drawing by F. Thomas in V. Place's "Ninive et l'Assyrie" (1867), Pl. 13 bis.

One of the most interesting features of the platform from the point of view of construction is to be found in the great arched drains, doubtless chiefly intended to carry off the downpour during the rainy season (Figure 23). These are sometimes semicircular, sometimes elliptical, sometimes pointed in section. The bricks of which they were built are laid in asphalt mortar and each course instead of standing vertically is slightly inclined. The courses thus lean against and support

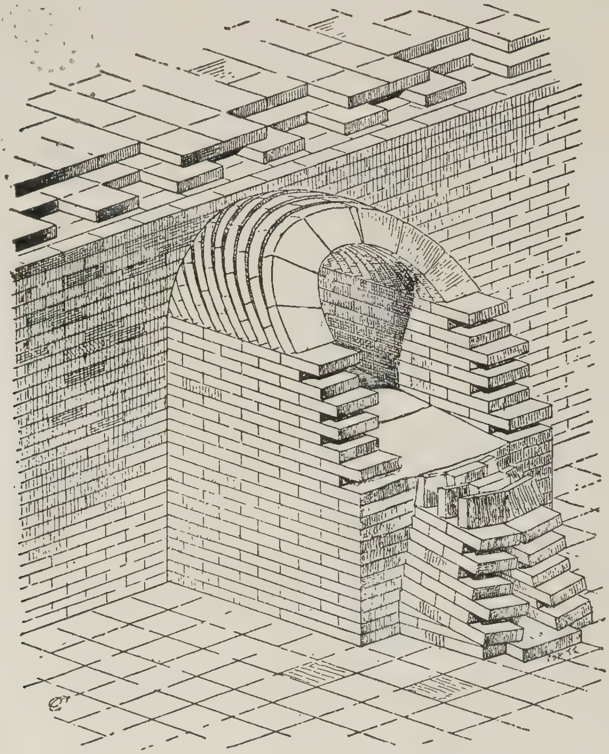


FIGURE 23. VAULTED DRAIN FROM KHORSABAD.
From G. Perrot and C. Chipiez' "Art in Chaldæa and Assyria," Vol. I (1884), Fig. 93.

each other, finally leaning against the wall from which they start. Each brick is laid with its widest face in the direction of the span of the vault, thus diminishing the tendency of each course to fall out of place in process of building, and making it possible, aided by the use of excellent mortar, to construct the vault without the wooden centering or temporary support otherwise necessary to hold up an arch or vault until the ring of the vault is completed by the insertion of the last brick or "keystone." Such construction may be called "laminated" vault construction, because of the laminæ or layers of which such a vault consists. The most remarkable ancient instance of this mode of vault construction is to be found, not in Mesopotamia, but in Egypt, in the substructure of the Ramesseum at Thebes (Figure 24). Although these

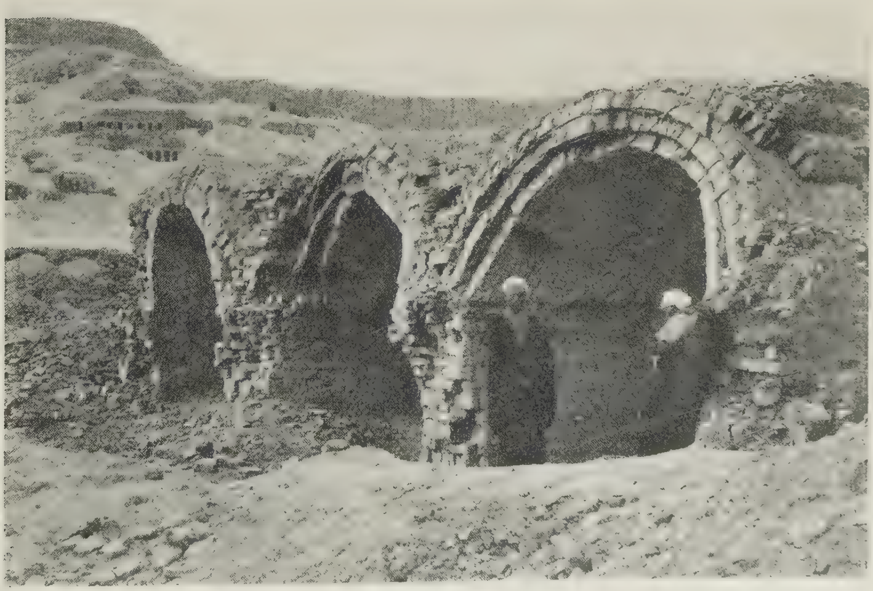


FIGURE 24. VAULTED STORE CHAMBERS OF THE RAMESSEUM AT THEBES.

vaults are older than the Assyrian examples, it seems nevertheless likely that their constructive system was derived from Mesopotamia, whence in all probability the Egyptians had their knowledge of burnt brick and of arch construction. In Egypt the vault never was a typical mode of work, never was used except in purely utilitarian and generally hidden construction, and therefore never in that country played any part in architectural development. In Mesopotamia, on the other hand, the arch and the vault were important architectural elements. The arch in this and the adjoining regions both westward and eastward had a continuous history of surpassing interest, and the laminated mode of vault construction, devised doubtless to avoid the use of centering on account of the comparative scarcity of timber, ultimately in Christian times played its part in the productions of the Byzantine style.

It seems surprising that the laminated method of vault building was apparently not used in the great arched gateways, where its employment might have seemed, on account of the comparatively large size of the vault, particularly important in the saving of wooden centering.

The palace built upon this platform consisted, as will be seen by its plan (Figure 25), of two very large, and numerous smaller, courts about which the apartments were arranged. The top of the platform was reached from the side of the city by two approaches. One of these was by a double flight of steps placed against the centre of the platform and leading to a great arched and tower-flanked gateway which led to the largest court, nearly square and measuring roughly three hundred feet in each direction. This court with the smaller courts and apartments attached to it was probably devoted to service and to the accommodation of the numerous retinue of the king. The second approach was by an inclined way built against the northeastern side of the platform. This formed the chariot road to the top of the city wall. What appears to have been the royal entrance to the palace was a gateway placed in an angle near the top of the inclined way. The position of this gate flanked by the wall at right angles to it

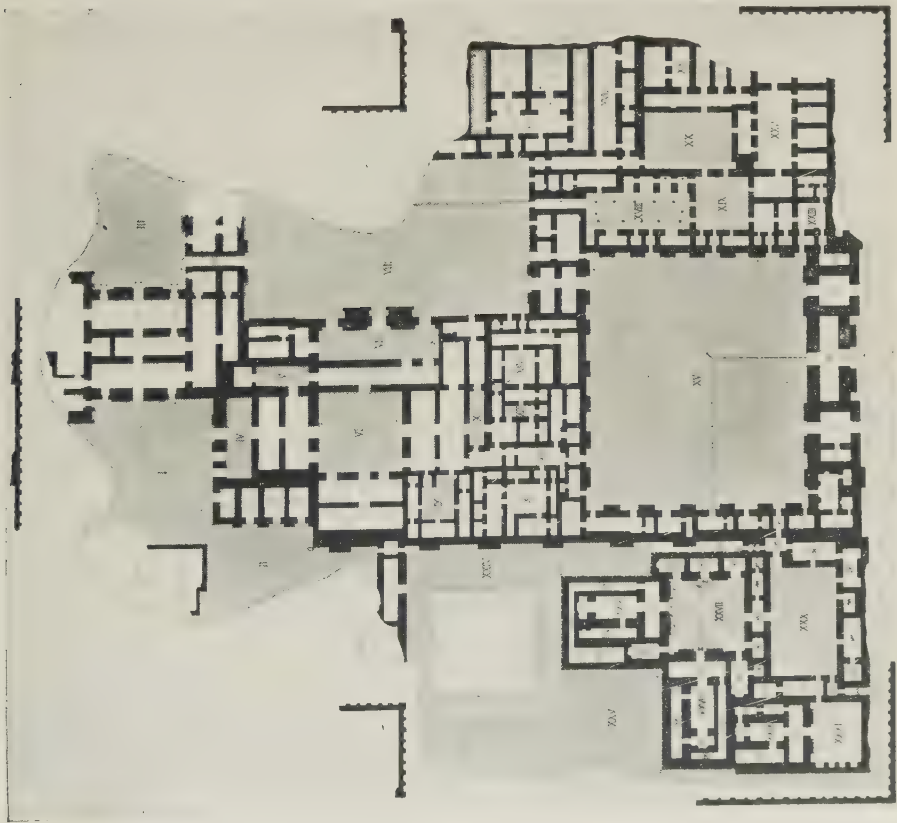


FIGURE 25. PLAN OF THE PALACE OF SARGON AT KHORSABAD.
From V. Place's "Ninive et l'Assyrie" (1867), Pl. 5.

gave it greater security. This gate gave access to an oblong court near the centre of one of the long sides. It was probably the outer court of the residence portion of the palace. Across the court a second and similar tower-flanked gateway led to an inner court and beyond that was an interior square court, which may have served as the hall of audience or throne room of the palace and about which the royal apartments were probably arranged. Through interior apartments this inner court is connected with the great service courtyard. Somewhat detached from the main palace, but adjoining it beyond the great service court, is a third important structural group. This was, until recently, regarded as the harem or women's apartments, but Andrae, the explorer of the temple at Assur above referred to, has shown that this group was in all probability a temple and that the ziggurat immediately behind it, of which there are still four stages left standing, belonged to it. The whole arrangement is quite similar to that of the temple of Assur.

Of all these structures only the lower part of the walls remains. The superstructure can only be conjecturally restored, but the representations of the bas-reliefs afford abundant material for such restorations. The greatest question arises with regard to the construction and formation of the roof: mainly as to whether this was of wood or of masonry. Timber was comparatively scarce, and, although in some cases beams and planks of timber covered with clay may have been used to form the flat terraced roofs, the remains of the palaces seem to point distinctly to the semicircular arch or barrel-vault as the system of covering employed. The apartments of the palaces are long and narrow and have very thick walls, often as much as twelve feet; precisely the arrangement which the barrel-vault would require. Place thought he found fragments of such vaults lying where they had fallen on the floors of some of the apartments. This supposition is made the more likely since the discovery of barrel-vaulted tombs in the ruins of Assur. Cylindrical tiles, which cannot have been drains, suggested to Place that they might have been embedded in the vaulting in order to form holes in the roof through which the light could enter. In later times such piercings are found in the domes of the Sassanian period. In some of the more important chambers the top of the vault may have been allowed to project above the level of the surrounding terraces so as to admit light through the end of the vault. Some of the smaller rooms opening into the courts were probably lighted through their doorways only. Of the use of windows there is no evidence. From some bas-relief representations and the existence of certain square apartments Place conjectured the occasional use of the dome. But there is no evidence of any such use. The representations of the low reliefs would seem to indicate structures of comparatively small scale, possibly built of sun-dried brick, and suggest wigwam-like huts more than masonry domes and in either case are shown as standing apart from other structures, while the square apartments actually found may very probably have been small open courts or light-wells. That in many cases the terraced roofs were surmounted by colonnaded porticoes as a protection from the sun is made very clear by the low reliefs.

The columns seem without much doubt to have been of wood protected and decorated with bronze. An inscription of Assurnazirpal says of his palace: "I surrounded it with a cornice of copper. Sculptures of the creatures of land and sea carved with alabaster I made and placed at the doors. I made lofty door-posts of cedar-wood and sheathed them with copper and set them upon the gates," and elsewhere the cuneiform inscription speaks of "posts of cedar-wood overlaid with plates of gold (gilded bronze?)". Place found fragments of bronze plates (such as might have covered a wooden shaft) beaten into decorative scale-like forms that resemble the conventional representation of the trunks of palm trees which the reliefs often show. The columns of the reliefs have capitals with volute or scroll decorations and leaf-forms, both of them suggestive of beaten metal. Such capitals may well have been examples of types which led ultimately to the development of the Ionic and Corinthian stone capitals of the Greeks. Some small shrines represented in the reliefs have similar columns with scroll capitals. The representations of chairs, thrones, and altars in which the scroll decoration is used similarly suggest that in the objects themselves such decorations were of beaten metal. So inevitably is the scroll or spiral the result of the processes of wrought metal that it is a familiar and characteristic form of beaten metal work in nearly all styles and all ages.

The edges of the terraced roofs and of the towers were protected by stepped battlements, which, to judge from the representations, were richly decorated — probably in color — with rosettes. They were often constructed of enamelled brick. The Persians later borrowed this form of parapet, and examples of it carried out in stone are to be seen among the Persian ruins.

It is to be noted with regard to the planning of the Assyrian palaces that the long and narrow rectangular apartments of which they consisted are entered on the long sides. There are no corridors, no passages of communication; but the rooms are set side by side, forming an agglomerative plan very different from the ordered symmetry of Egyptian buildings. There is no recognition of axes as in Egypt, no organic character in the plan. The doorways are irregularly placed and are often not opposite to each other.

Among the forms of Assyrian art which have a bearing on subsequent development none are more important than the forms of the decoration, from some of which certain well-known Greek forms would seem to have been in part derived. As we have seen, the lower part of the walls of the chief rooms of the Assyrian palaces was decorated with carved slabs of alabaster, whose reliefs — doubtless originally richly colored — celebrated the exploits and the life of the king and his armies. Elsewhere the walls were faced with enamelled brick in brilliant colors, or covered with stucco which then was similarly painted. The remains of these, and especially of the carved stone thresholds of some of the doorways, show the character of the decoration (Figure 26). The patterns of the thresholds were clearly suggested by those of rugs which they very evidently simulate. They consist of a central panel surrounded by a border. The patterns of the centre are generally such as are common among primitive peoples, like the flower pattern formed by interlacing circles. In one case at Koyundjik this pattern is surrounded by a border or band of repeated rosettes, outside of which there is a lotus-flower and bud pattern clearly suggested by the similar Egyptian borders, but having a distinctive character in the treatment both of flowers and buds which marks it as Assyrian. In other cases, the centre is divided into square panels, each with the lotus-flower and bud radiating about a central rosette, the whole threshold having the lotus-flower and bud border. An example from Koyundjik in which a pine-cone form is substituted for the lotus-bud has this treatment. The bands between the minor panels are decorated with rosettes. A peculiarly characteristic Assyrian form is that of the palmetto decoration with its radiating lobes. It appears especially in the representation of the mystic tree which plays so frequent a part in the religious symbolism. It is used also in the decorative border side by side with the lotus-flower and bud ornament. The palmetto decoration is sometimes associated in alternation with animal forms, such as the deer or the winged bull. The same forms are found in the enamelled brick and in the painted decorations. Ornaments of these types were used with slight modifications throughout the whole of western Asia, including Asia Minor. It is not unnatural, therefore, that they are found to have had their share in producing many of the accepted types of Greek decoration.

These details enable us finally to complete in our minds the picture of a Mesopotamian city, which so fully reflects the conditions of Mesopotamian civilization. If one approached one of these great cities across the richly cultivated plains intersected by irrigating canals, or by oar or sail along the river in one of the numerous boats, many of them laden with merchandise, one would have glimpses here and there, among the groves of palms, of the peasants' huts in groups, or of some small shrine, its bright colors and the copper decorations of its wooden columns reflected in the water. Occasionally perhaps some larger villa or palace would be seen with tower-like pavilion and low colonnaded porticoes along the roof terraces. Nearing the city the vast circuit of the walls would rise before one, broken at regular intervals by the numerous towers and

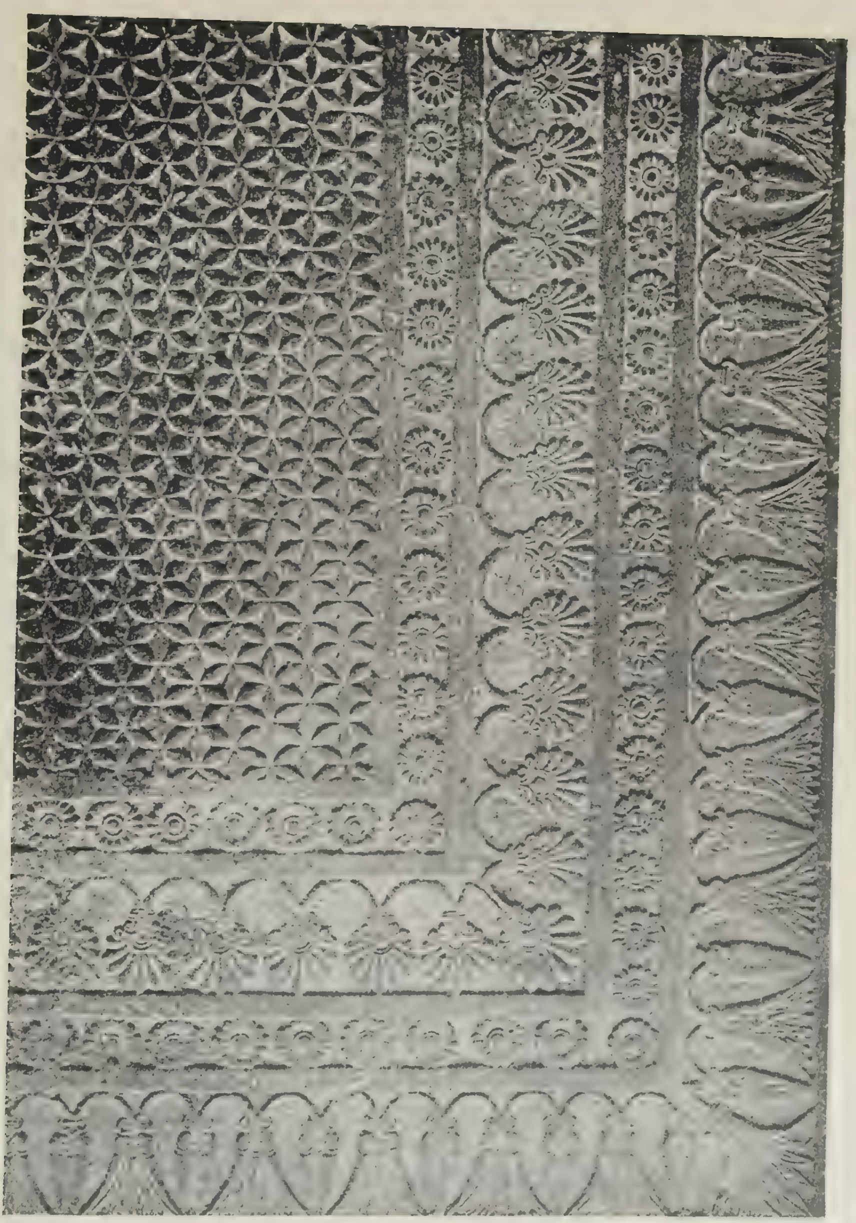
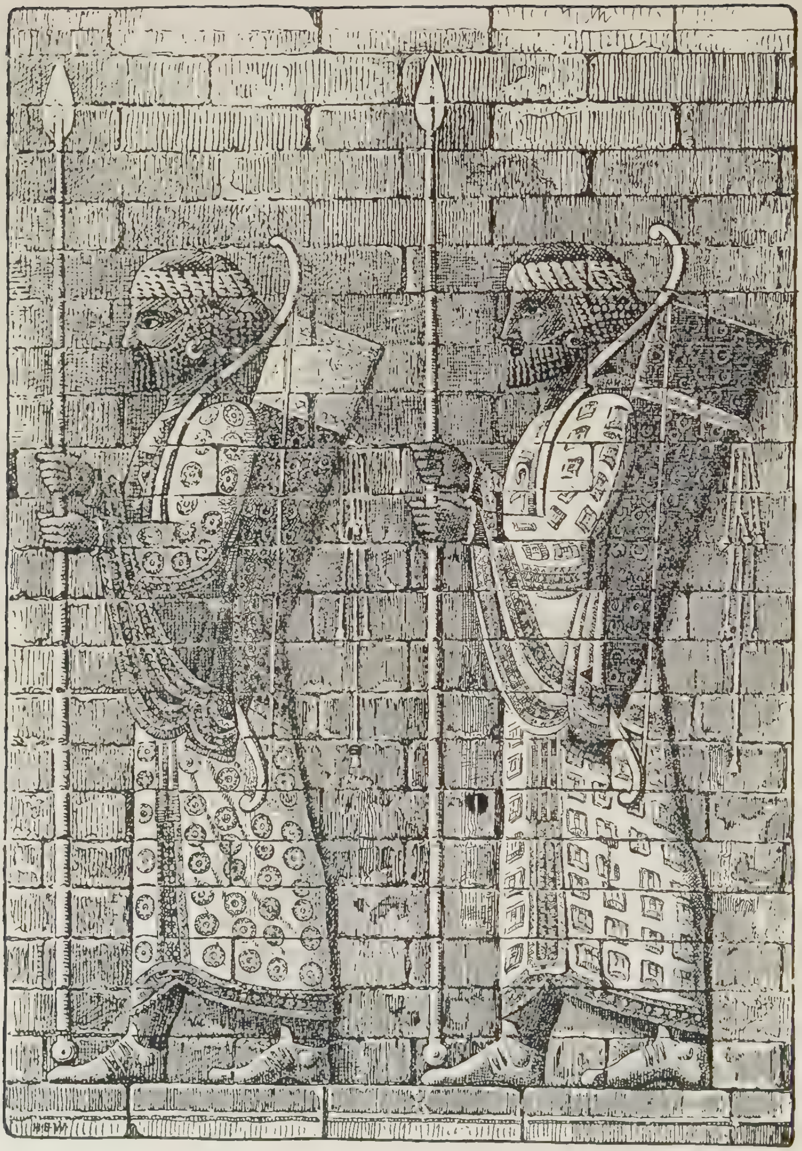


FIGURE 26. FLOOR SLAB FROM SENNACHERIB'S PALACE AT KOYUNDJIK.

occasionally by the great richly colored gateways with their barbicans, the walls sharply sundering the city from the country. If it were Babylon itself we should find a double ring of these walls with great moats or ditches. Of the buildings within the city there would be seen from without — even from a distance — nothing save the great fortified palaces or their dominating terraces and, overtopping all, the vast ziggurats — the stepped pyramids of the temples — their crenelated stages glowing with gold and rich with full colors by which each stage was distinguished. Making one's way through the motley crowd and past the sentinels at the gates, one would pass, by narrow streets running usually at right angles, the plain flat-topped houses sometimes of two, three, or even four stories (Herodotus 7. 180). By crowded bazaars and across open squares, by parks and gardens, one might go until one reached the huge terrace on the top of which the palace arose, brilliant with color. If we could follow the chariots driving up the inclined way, if the great bronze doors under the arches, brilliant with enamelled tile, could be thrown open for us, and between the man-headed winged bulls and strange winged genii we could penetrate into the interior, we should find ourselves in a world of oriental richness and splendor not surpassed, perhaps hardly equalled, by the most gorgeous architecture of Indian potentates, with which it has a certain kinship.

Sunlit courts alive with brilliantly colored robes precede cool dim halls carpeted with rich rugs: halls through which we might pass into the august presence of the very monarch himself, or into the vestibule of the sanctuary of the god, at the foot of the towering ziggurat, shining with purple, silver, and gold.

Passing out again, from the top of the great wall we should look across the limitless plain, with fields of grain and groves of palm and the river winding through, and on the opposite side we should overlook the city with its parks and gardens, its temples with their towering ziggurats, and the flat roofs of the houses shimmering white in the sunlight.



From a drawing by Harold B. Warren.

III

PERSIA

The ancient art of Persia is of so late a date that it cannot have contributed anything to the origins of the art of Greece. Indeed, with regard to Greece it was to some slight extent a borrower rather than a lender. Nevertheless the early Persian art throws some light on those still earlier forms, which in numerous variations were current throughout the whole of the near East from Asia Minor to the Persian plateau. As a later phase of that art it helps not only to explain some features of the art of Mesopotamia from which it largely borrowed, but throws back, as it were, some light on the art of Syria and of Asia Minor from which some of the elements of the Greek — especially of the Ionic — art were undoubtedly in part derived. It is in this indirect way that the art of ancient Persia is of importance to a consideration of the later classical development.

Persia is a high plateau country lying immediately to the east of the Mesopotamian plain, from which it rises abruptly, bordered and intersected by mountain ranges. Its climate is temperate and differs therefore entirely from that of Mesopotamia. Its upland valleys bear groves of oak and chestnut. It was therefore naturally a timber-using country. Its art however was as yet undeveloped when, under Cyrus, Persia, hitherto a vassal kingdom, not only made itself independent, 74, 303

but became dominant over the Medes (already masters of Assyria), conquered Babylon, and extended the Persian Empire to the coasts of Syria and Asia Minor. Under Cambyses Egypt too was overcome, an event which is reflected in the Egyptian character of some of the forms of the later Persian architecture.

It was natural that the less civilized Persians, suddenly attaining a dominant position and coming in contact with the fully developed art of Nineveh and Babylon, of Syria and Egypt, should have been led largely to borrow and imitate the arts of these countries, engrafting them upon their native forms which depended upon the use of wood. Persian art has therefore the characteristics of an art which is not an indigenous and natural development but which borrows and adapts forms not altogether in harmony with its own conditions.

For the purposes of the present study attention may be confined to the wonderful ruins of the palaces and tombs of the Persian kings at their capital, Persepolis, which constitute the most important of Persian remains. These buildings were chiefly the work of Darius I, who first fixed the royal residence here, and of Xerxes, between B.C. 520 and 464.

The ruins are situated about thirty-five miles northeast of the modern Shiraz in a mountain valley, known as Merv Dasht, through which flows the river Bend-Amir. The valley or plain at this point has a width of about seven miles. The ruins are on the northeast side of the valley, backed against the mountain side near the point where a small river, the Polvar, emerges from a narrower valley to join the Bend-Amir. They stand on a great terrace partly built up above the plain, partly cut into the mountain side (Figures 27 and

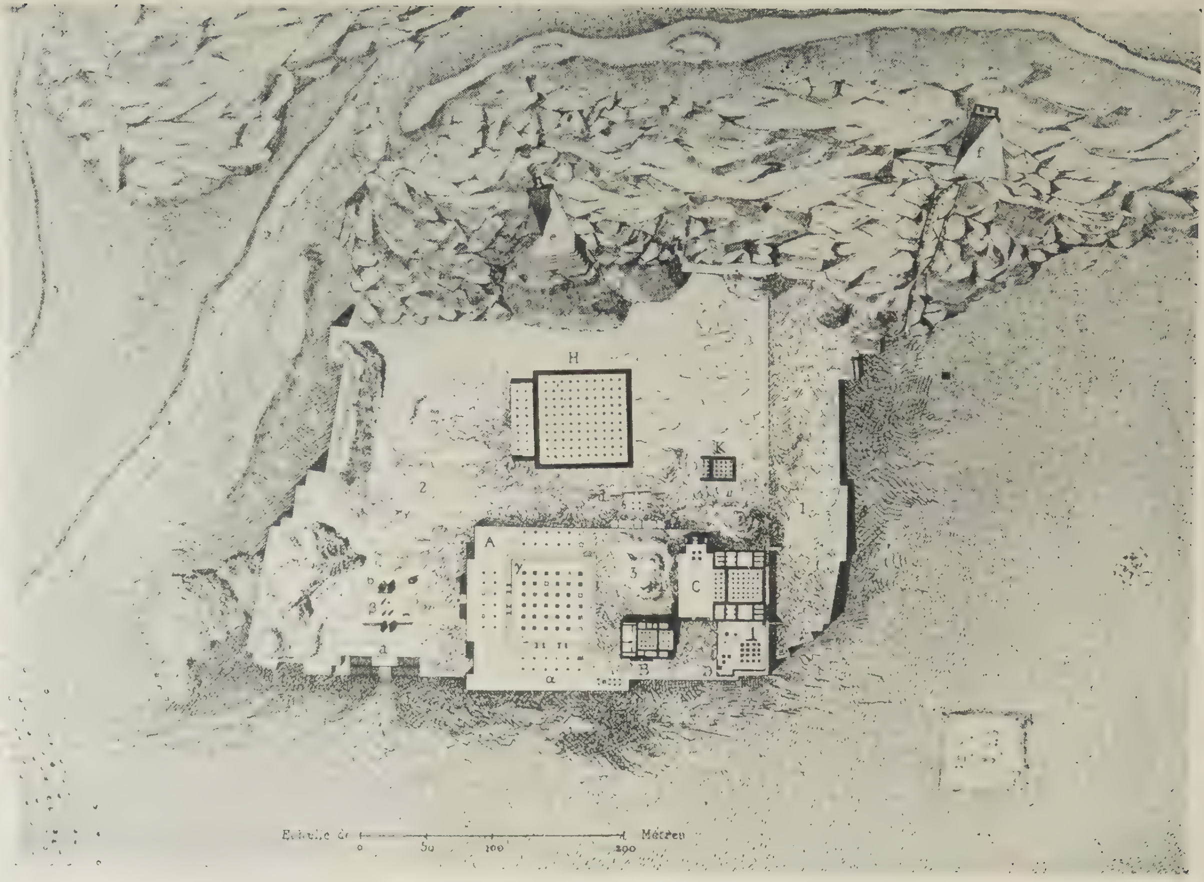


FIGURE 27. PLAN OF THE PALACE PLATFORM AT PERSEPOLIS.

From M. Dieulafoy's "L'art antique de la Perse," Vol. I (1884).

a Grand staircase
b. Propylæa of Xerxes
d. Portico
e & f. Royal tombs
A. Apadana of Xerxes
B. Palace of Darius
C. Palace of Xerxes
D. Palace of Artaxerxes
H. Hall of One Hundred Columns
K. Small apadana

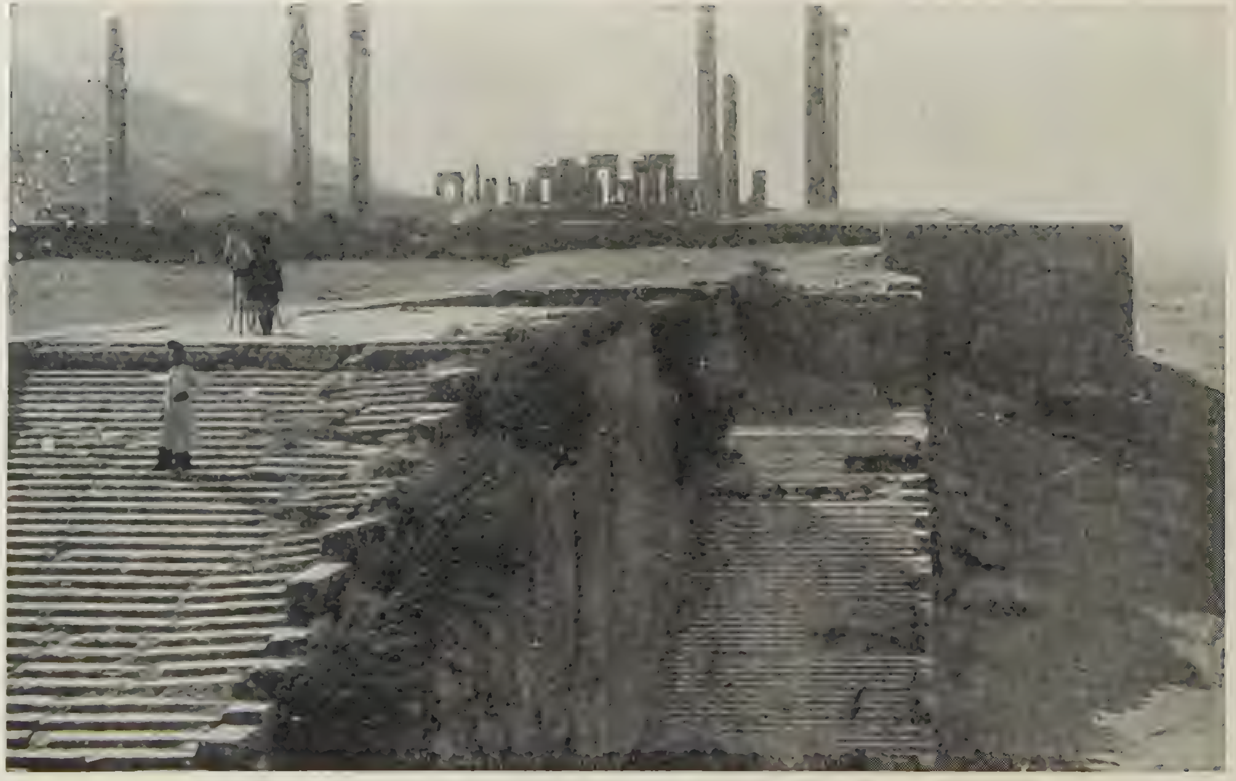


FIGURE 28. THE PALACE PLATFORM AT PERSEPOLIS.

28). The terrace, though more irregular in outline, is evidently imitated from those of the Assyrian palaces. It was however not fortified. The defences of the city were placed across the valleys leading to it. The conditions did not require such walls as those of Mesopotamia. The terrace is faced with an irregularly coursed masonry of cut stone. The height of the terrace varies with the unevenness of the ground from about thirty to something over forty feet. It measures roughly about fifteen hundred feet across the front and is nearly one thousand feet in depth from the face of the terrace to the mountain background. On the front, near the northeastern corner, a double flight of black marble steps of easy gradient gives access to the top of the terrace, where, on the axis of these steps, is an open colonnaded gateway or portico. The lower part only of the great doorways at the end of this portico are standing. They had, to judge from other remains on the terrace, a character not unlike that of Egyptian doorways. It is unlikely that they were arched like the Assyrian examples; but the great door jambs of massive stone rest on the backs of colossal man-headed bulls clearly imitated from those of Assyria (Figure 29), lacking however the spontaneity and the evidence of close observation of nature shown in the Assyrian sculpture. The creator of these monsters, each about twenty feet in length and sixteen feet high, did not have nature, but only the Assyrian prototype, in mind as he wrought.

The terrace bears the remains of seven other distinct buildings or groups. Of these the most important are the great Hall of Xerxes, the so-called Hall of the One Hundred Columns, the palace of Darius, and the palace of Xerxes. In the cliff at the back of the terrace are two of the remarkable rock-cut tombs.

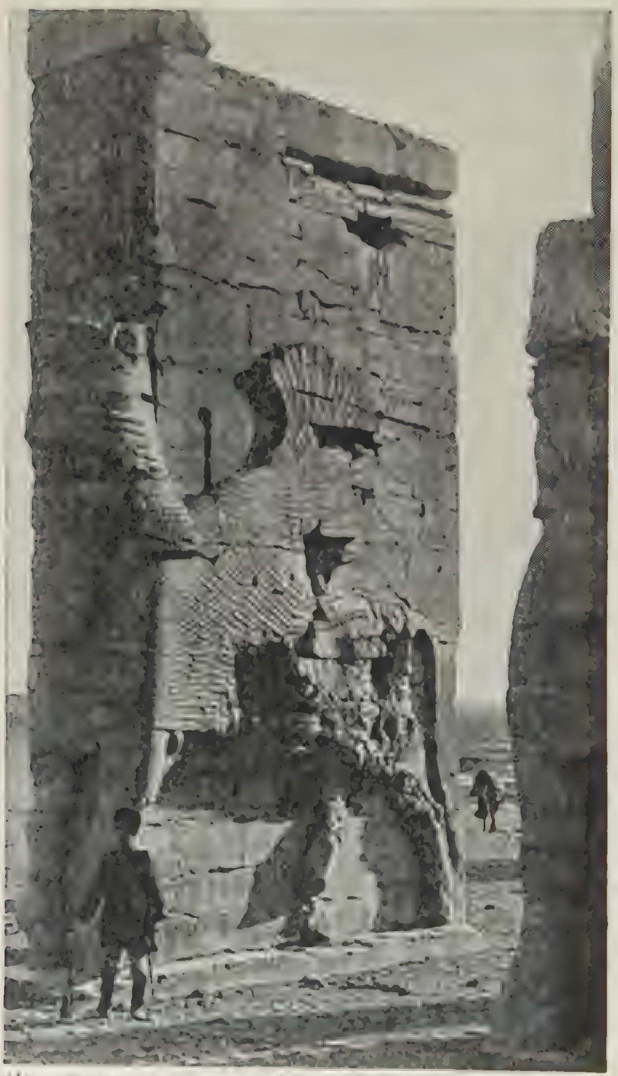


FIGURE 29. THE GATEWAY AT PERSEPOLIS

The Hall of Xerxes or Chehil-Minar — "the forty-columned" as the Persians call it (the central hall has thirty-six columns) — stood on a platform nearly ten feet above the general level of the great terrace. Against the main face of this platform four flights of broad steps lead to the upper level. The whole face of the retaining wall between the steps is decorated with low reliefs mainly representing soldiers and tributaries. On the platform thirteen slender columns of stone still stand nearly to their original enormous height of sixty-three feet nine inches. The shafts have forty-eight flutes and diminish upwards to a diameter of four feet and a half. The columns are of two types. Both have bell-shaped bases, decorated with a leaflike ornament and surmounted by a torus, the form of which, with the astragal which terminates the shaft, suggests Greek influence, while other decorations recall the Greek egg and dart. The simpler columns consist, above the base, of a shaft terminated by a crotched capital formed of kneeling bulls. For the similar capitals of the palaces of Xerxes the fore part of lions is represented. These capitals were undoubtedly derived from crotched capitals of wood, such as may still be seen in Persian huts of to-day, formed of trunks of trees with the butts of the forked branches left at the top to form capitals.

The columns of the second type have capitals of much more complicated form, with three superposed motives: first a range of down-hanging leaves; then a series of up-growing leaves, which resemble the Egyptian campaniform capital; this is surmounted by a square portion, on each face of which are double scrolls or volutes set vertically (Figure 30). The scroll motives and the very form of the scrolls themselves, the sharp undercutting of the leaves, and the whole character of the decoration suggest an imitation of metal work. Indeed the forms seem to contradict the nature of the material — stone — in which they are wrought. Clearly the whole column is of secondary type. No craftsmen accustomed generation after generation to work in stone could be imagined as evolving such types as these. The carvers were clearly but repeating forms which had become fixed in the traditions of another material. We are justified in feeling confident that we have here forms which resulted from the reproduction in stone of types that had been evolved in columns of wood decorated with metal.

The columns of the Hall of Xerxes of this more complicated kind are nine feet and seven inches shorter than the simpler form. Like the latter they may have been surmounted by the crotched bull-capitals or, as suggested by Fergusson, may have carried brackets of wood.

What the complete plan of this building was in its original form remains in doubt. The existing bases and the columns still standing show that they were arranged in four groups: a central square group of six rows of six columns in each row, the distance from centre to centre of the outside columns being one hundred and forty-two feet and eight inches, and three hexastyle porticoes each with a double row of columns. Perrot supposed that there were four distinct and isolated flat-roofed porticoes each similar in general character to such modern Persian buildings as the Pavilion of Mirrors at Ispahan. Fergusson restored the plan as that of a building with a central hypostyle hall enclosed by walls and entered by the three hexastyle porticoes, the angles of the building being occupied by chambers. He supposes these walls, of which there is no trace, to have been of brick. This restoration brings the

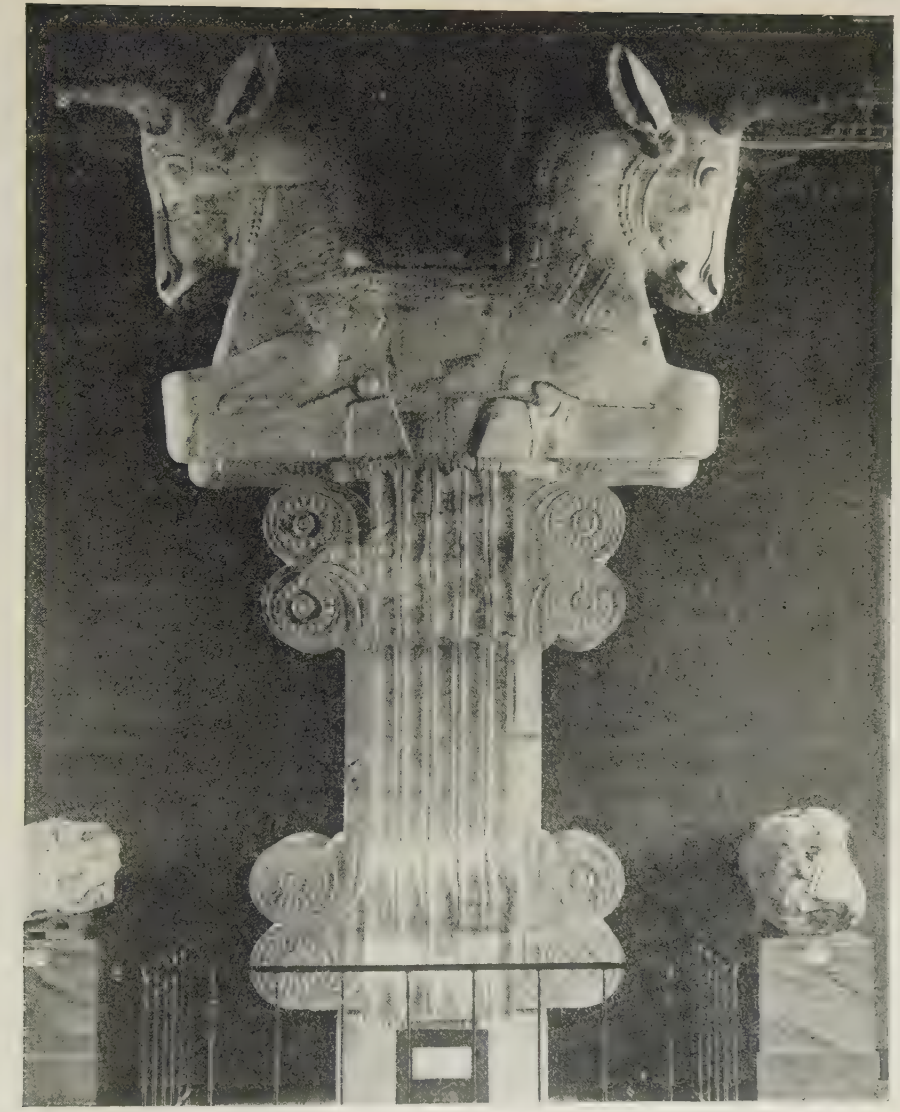


FIGURE 30. UPPER PORTION OF A PERSIAN CAPITAL FROM SUSA.

building into the same class as the palaces of Darius and Xerxes. The analogy of these buildings, and the existence of stone door jambs as entrances from the front portico to the main hall support this view. The superstructure was undoubtedly of wood. This is already implied by the intercolumniation, which is twenty-nine and a half feet, measured from the centres of the columns. The form of this wooden entablature is in other cases clearly indicated by the sinkages in the top of the stone antæ or jamb-piers, which were formed to receive the ends of this beam-system, and also by the representations of this beam-system in the façades of the rock-cut tombs.

The existence of these tombs, which clearly reproduce the palace fronts, and the greater completeness of the remains themselves, make a restoration of the palaces of Darius and of Xerxes more certainly possible. The latter is the larger. That of Darius is more complete and the façade of it (Figure 31) seems to be precisely reproduced in the tomb of Darius carved in the cliff of Naksh-i-Rustum, about three miles from Persepolis beyond the Polvar (Figure 32). Even the dimensions are nearly identical. The columns are similar to those of the simpler type used in the side porticoes of the Hall of Xerxes. In the tomb façades the ends of the great beams are shown resting in the crotch of the capitals. The entablature of the tomb corresponds precisely with that implied by the sockets in the top of the stone anta of the Palace of Darius. It consisted evidently of a compound beam formed by three superposed planks on which rested the squared rafters, placed close together and projecting so as to form dentils. On these again were further planks bearing the flat roof. The edge of this was in all probability faced with enamelled tile. This

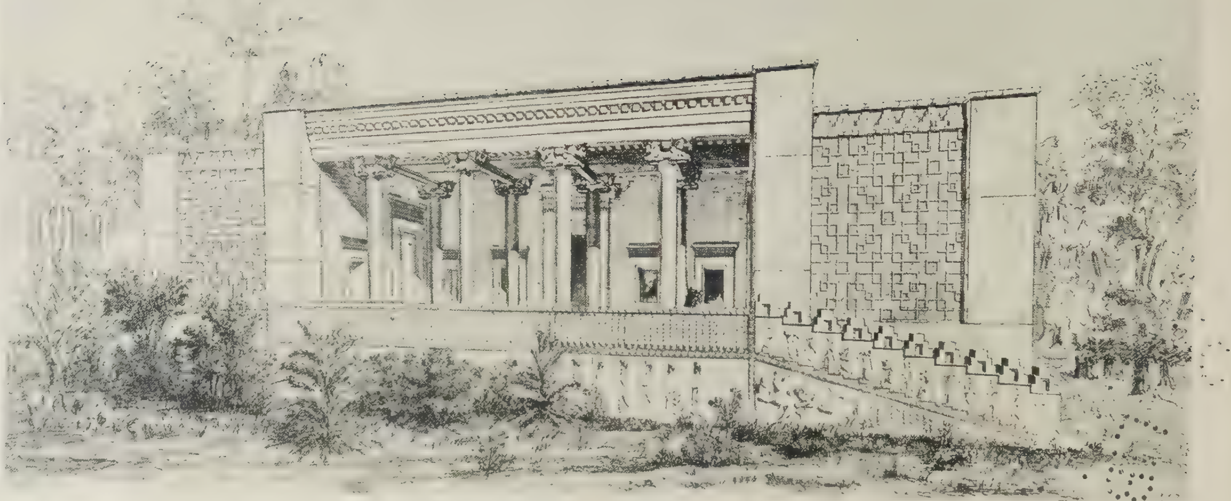


FIGURE 31. THE PALACE OF DARIUS, RESTORED.

From M. Dieulafoy's "L'art antique de la Perse," Vol. I (1884), Pl. 7.

seems to be indicated both by the tomb façades and by remains discovered especially at Susa.

Above the roof in the tomb façade is a raised platform which Fergusson mistook for a representation of a part of the palace. It seems more likely to be intended to represent a dais within the palace. The form of it seems to suggest a construction of metal, or wood and metal. Its sides are supported by ranges of figures and the corners are formed by posts of turned shape with lions' feet resting on turned bases, while the angles are surmounted by lions' heads. On this dais the king is represented worshipping before an altar. On a jamb-stone of the Hall of the One Hundred Columns the king is represented on a similar dais enthroned under a light baldachino, evidently richly embroidered cloth supported by slender poles at the angles. Frequently in ancient art scenes within a building are represented above its façade.

Other most interesting details of the Palace of Darius are the parapets of its steps of approach, which resemble Assyrian battlements; and its stone doorways, windows, and niches, which remain standing and which show a very close following of the forms of Egyptian doorways, the throat-moulded cornice with which they are surmounted differing only slightly from that of Egypt. On the jamb of the main doorway, in high relief, is a figure of the king as if entering through the door. Behind him his attendant shelters him with the royal umbrella. The attendant is life-size, the king larger than life. The stone doorways and windows, which now stand isolated, were connected with walls probably of brick.

The Hall of the One Hundred Columns is square. The one hundred columns, of which only the lower parts of six still remain standing, supported its flat roof. It may have

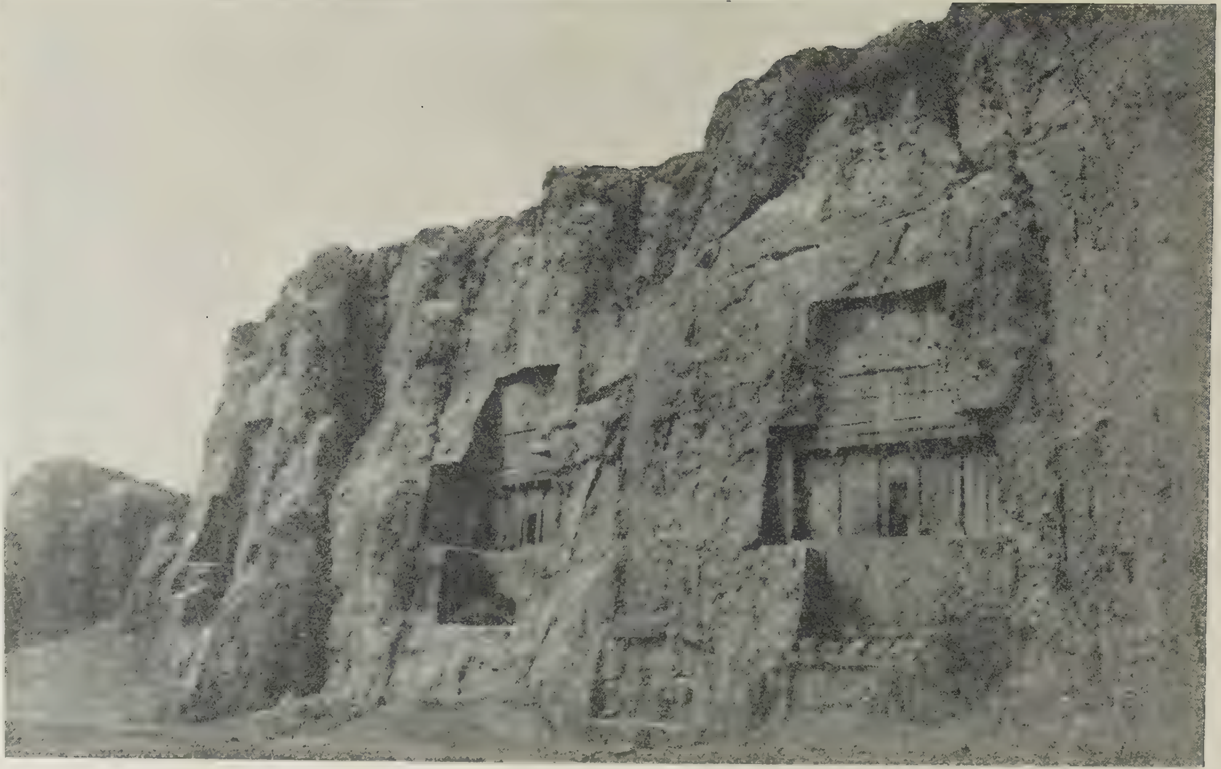
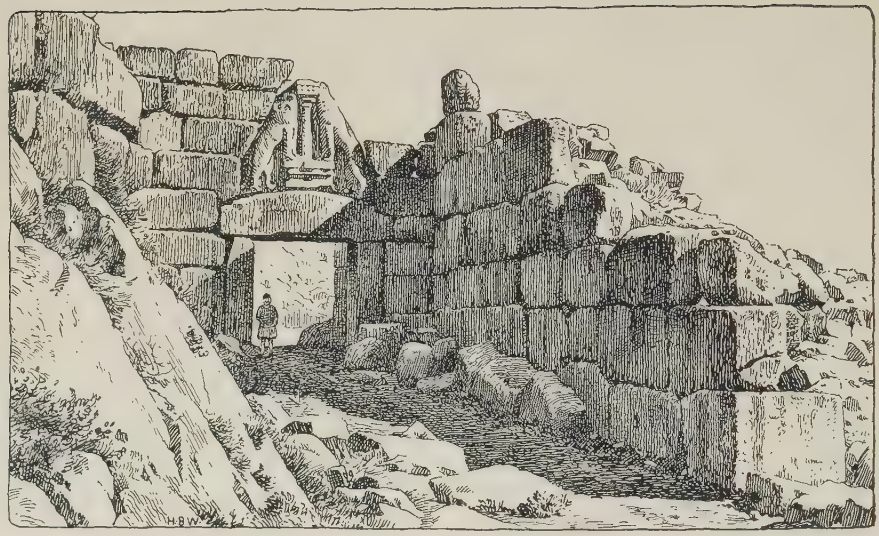


FIGURE 32. TOMBS OF THE PERSIAN KINGS AT NAKSH-I-RUSTUM.

been lighted by a central clearstory. It was preceded by an octastyle portico of two ranges of columns, the antæ or wing-walls of which were flanked by man-headed bulls similar to those of the Propylæum. The columns were of the more complicated type of the great Hall of Xerxes, but were much lower.

Next in importance to the remains of Persepolis are those of Susa, situated on the western slopes of the hills descending to the Chaldæan plain. The ruins are less well preserved, but show characteristics similar to those of Persepolis. Of most importance are the splendid friezes of enamelled brick, among which the frieze of the archers and the frieze of the lions, both now preserved in the Louvre, are the most perfect. (Headpiece to Chapter III.) The richness of their color and the beauty of their design show that the Mesopotamian art of enamelled brick had lost little under Persian rule. The soldiers are more lifelike than those of Assyrian reliefs, but the lions are conventional, evidently reminiscent of Assyrian decoration rather than studied from nature. In their kind these magnificent decorations have never been surpassed, and help to bring vividly before us the richness of color that must have belonged to Persian as to Mesopotamian art.

The structure of the great colonnaded halls of Persepolis suggests a comparison with the architecture of Egypt. Though the scheme of construction is similar, the effect must have been quite different. We may compare for instance the central colonnaded space or hall of the Chehil-Minar with the Hypostyle hall of Karnak. The Persian hall covers an area about half that of the Egyptian example. Its columns are nearly of the same height but they are of about half the diameter and even more widely spaced, twenty-nine and a half feet from centre to centre, a width of span made possible by the use of wood for the ceiling beams and roof, though covered with clay. The effect therefore of the Hall of Xerxes must have been one of openness and lightness, of lofty spaciousness, contrasting with the massive heaviness of the crowded columns of Karnak.



From a drawing by Harold B. Warren

IV

THE ÆGEAN

In considering the art of Persia in the time of Darius and Xerxes we were examining a form of art contemporary with that of historic Greece. We now have to go back again in time to consider the Ægean art, which in Greek lands preceded that of historic Greece, and out of which Greek art more or less directly sprang. We are carried back at least to a period contemporary with the eleventh and twelfth dynasties if not with the Old Kingdom, in Egypt, in other words to about two thousand or three thousand years before Christ.

In these lands in which Greek civilization grew up we meet with physical conditions utterly different from those of Egypt, Mesopotamia, or Persia, a region obviously certain to have been the cradle of a radically different civilization, producing an entirely different art, and especially an entirely different architecture.

Its situation in the southern temperate zone in itself constitutes an important difference, and although at first it seems to have had the flat roof, — perhaps because its architectural forms like the other forms of its art were originally, if not derived from southern races, at least developed in contact with the art of Egypt and Mesopotamia, — this form of roof was modified and the low-pitched roof that belongs to the southern temperate climate was developed as the necessary means of shedding rain.

But with Egypt, Mesopotamia, and Persia, all of which are inland countries, the home of Greek civilization, the coast and islands of the Ægean Sea, contrasts most of all in this: that it is a region not only of intermingled sea and land, but one in which the sea predominates over the land. It is clear that peoples inhabiting such countries must become seafaring folk. The mainland of Greece is deeply indented with bays separated by many narrow promontories. The important gulfs, that of Corinth and the Ambracian Gulf (now the Gulf of Arta) are on the west, but the greater number of good harbors are toward the east. All the country is mountainous, the valleys, watered by numerous streams, climbing inland from the bays. There are thus formed a series of districts open toward the sea and separated from each other by high hills. These districts in ancient times tended almost inevitably to become the home of independent, restricted, seafaring communities, each regarding the peoples on the other side of the mountains as enemies. The opposite coast of Asia Minor was similar in character and the two coasts were connected by numerous islands, so near together as to tempt primitive man, even with the frailest boats, to adventure on the sea. These coasts and these islands were the Greek lands. They became the home of eager, restless, adventurous peoples carrying on commerce (constantly associated with piracy) with each other, with Egypt, and with Syria, and ultimately extending their activities and their homes to Sicily and the southern coasts of Italy, and penetrating northward into the Black Sea.

It is only since the epoch-making explorations and discoveries of the palace at Knossos in Crete begun in 1900 by the English scholar Evans, and carried forward chiefly by him, that the earliest civilization in the Ægean has become known. These discoveries have revolutionized the ideas held with regard to the origins of Greek civilization and have placed the conceptions on a much firmer foundation than hitherto; at the same time raising many new questions while destroying old theories which had come to be regarded almost as facts.

Crete, the great island which bounds the Grecian Archipelago on the south, is now seen to have been the centre of the earliest Ægean civilization. A continuous and connected growth seems to have taken place here from the neolithic age down to the time of the eighteenth Egyptian dynasty, when Knossos, the great Cretan capital, was destroyed and its power came to an end. The Cretan people of these early ages were of a different race from the subsequent Greeks. They were perhaps not even Aryan. They were certainly not Semitic. The earliest remains of the architecture of this remarkable people date from the time of the eleventh Egyptian dynasty. These are the remains of the earliest palaces at Knossos and Phæstos. In the latter part of the twelfth Egyptian dynasty

Knossos was destroyed, but it rose again into even greater power, and the larger part of the great palace of the Cretan kings discovered by Evans belongs to this later period. It is the power of these kings which is the basis of the Greek legends of King Minos, on which account it has become the custom to speak of this whole civilization as Minoan. The palace at Knossos, with its great courts, its numerous small chambers, its halls and irregular passages, Dr. Evans identifies as the basis of the story of the Labyrinth ; and the fondness of the Cretans for bull fights as the foundation of the legend of the Minotaur, while the tribute of the Athenians indicates the widespread power of the Cretan kings which extended over the whole Ægean region. This dominance rested wholly on sea-power and was so great that the palace at Knossos was without walls and fortifications. The strong defence of the island state was evidently its fleet, and practically the whole intercourse of these Mediterranean lands was carried on by the Cretan ships.

Egyptian wall-paintings of the eighteenth dynasty show ambassadors of the Keftiu, the peoples of the sea, in costumes similar to those shown on the wall-paintings of Knossos bearing vases like those found in the Cretan ruins, while Cretan pottery has been found in Egypt and Egyptian objects have been unearthed in the Cretan palaces. Inscribed clay tablets and seals have been found. In the latest period writing with ink and a reed pen was in use, but as yet no clew to the deciphering of the Cretan script has appeared.

All the evidence points to a civilization of great splendor and considerable advancement. The beauty of the wrought metal work, of bas-reliefs and statuettes in porcelain, in ivory, and in plaster, the marvellously naturalistic representations of men and animals, especially bulls in action, the beautiful ornamentation of the pottery, the fresco-paintings of the palace walls, the jewellery, the gold cups (like those of Vaphio), the weapons, the buildings, all tell the same story. Of all this wonderful art we are here concerned only with the architecture

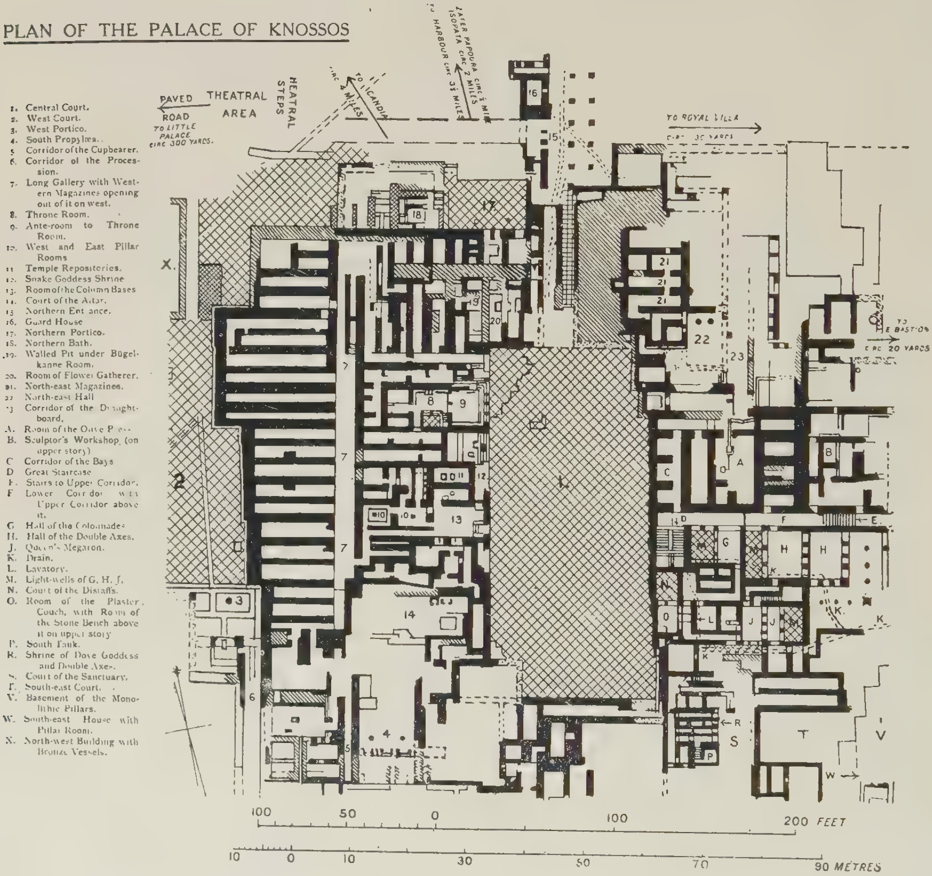

PLAN OF THE PALACE OF KNOSSOS
1. Central Court.
2. West Court.
3. West Portico.
4. South Propylæa.
5. Corridor of the Cupbearer.
6. Corridor of the Procession.
7. Long Gallery with Western Magazines opening out of it on west.
8. Throne Room.
9. Ante-room to Throne Room.
10. West and East Pillar Rooms
11. Temple Repositories.
12. Snake Goddess Shrine
13. Room of the Column Bases
14. Court of the Altar.
15. Northern Entrance.
16. Guard House
17. Northern Portico.
18. Northern Bath.
19. Walled Pit under Bügelkanne Room.
20. Room of Flower Gatherer.
21. North-east Magazines.
22. North-east Hall
23. Corridor of the Draught-board.
A. Room of the Olive Press
B. Sculptor's Workshop (on upper story)
C. Corridor of the Bays
D. Great Staircase
E. Stairs to Upper Corridor.
F. Lower Corridor with Upper Corridor above it.
G. Hall of the Colonnades
H. Hall of the Double Axes.
J. Queen's Megaron.
K. Drain.
L. Lavatory.
M. Light-wells of G, H, J.
N. Court of the Distaffs.
O. Room of the Plaster Couch, with Room of the Stone Bench above it on upper story
P. South Tank.
R. Shrine of Dove Goddess and Double Axes.
S. Court of the Sanctuary.
T. South-east Court.
V. Basement of the Monolithic Pillars.
W. South-east House with Pillar Room.
X. North-west Building with Bronze Vessels.
PAVED ROAD
TO LITTLE PALACE CIRC 300 YARDS
THEATRAL AREA
THEATRAL STEPS
TO CANDIA 4 MILES
TO HARBOUR CIRC 3½ MILES
TO ROYAL VILLA CIRC 30 YARDS
TO E BASTION CIRC 20 YARDS
100 50 0 100 200 FEET
10 0 10 30 50 70 90 METRES

FIGURE 33. THE PALACE OF KNOSSOS.

From R. M. Burrows' "The Discoveries in Crete" (1907), Pl. 4.

and with this only so far as its forms have some bearing on the story of subsequent development.

We may confine our attention to the palace at Knossos (Figure 33). The ruins occupy the upper part of a hill overlooking the ancient site of Knossos, and as the ground slopes away the number of stories in the palace increases. There are important remains of stone staircases. The construction was mainly of stone, with some remarkable stone piers, square in plan. Most of the columns were clearly however of wood, and carried wooden beams. The sockets remain in which these columns rested and their form is clearly shown in some of the wall paintings. They have been reproduced by Evans in his restoration of the colonnaded staircase hall, a work necessary in order to support what remained of the upper stories (Figure 34). The ruins of the palace occupy roughly a square measuring about four hundred feet in each direction. The main feature is a great paved court, one hundred ninety feet long and ninety feet wide. The main entrance to the palace was at the northern end of this court. On the west toward the city was another court and north of this a paved space about forty feet by thirty feet with tiers of stone on two sides. This has been called the "theatral area." It is supposed that it was the site for some sport, and that the steps were seats for spectators. The plan of the palace is irregular and rambling. No great architectural scheme seems to have existed. It is an agglomerative plan, similar in this fundamental respect to the plans of the palaces of Mesopotamia, and contrasting, as did these, with the ordered unity of Egyptian planning. The roofs, therefore, must have been flat. The buildings also were many storied, in this respect unlike those of Mesopotamia and even those of Egypt. The many chambers are for the most

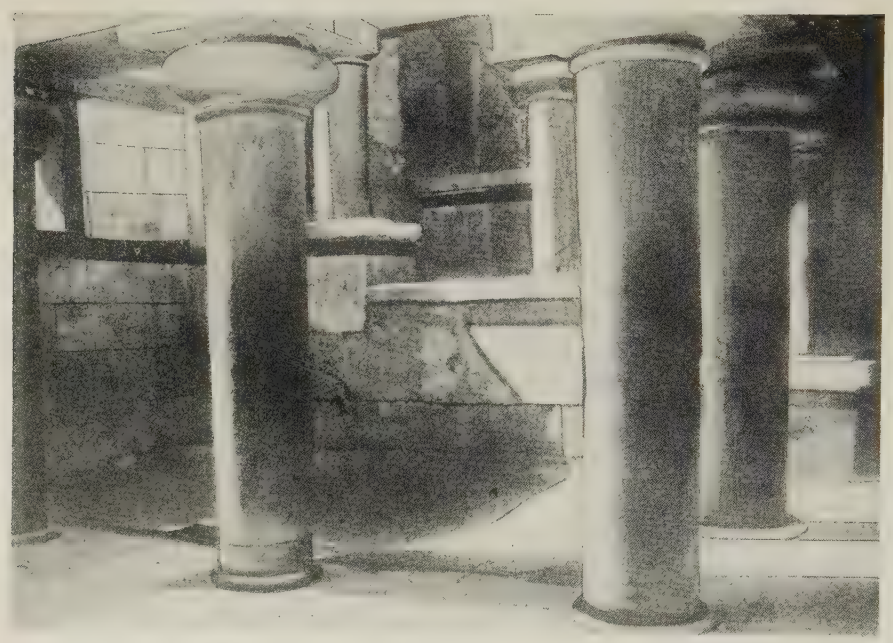


FIGURE 34. THE GREAT STAIRWAY AT KNOSSOS, AS RESTORED.

part long and narrow, reached by long corridors. There are several interior halls of moderate size, subdivided by colonnades. These are quite different in form and character from the megaron or great hall of the prehistoric Greek palace. Their entrances often have colonnades on two *adjoining* sides, and at the rear is often a light-well, since there are other rooms over them. The most important of these halls are the "Hall of the Double Axes" (so called from emblems, or mason's marks, on its square piers) and the Throne Room. The Hall of the Double Axes is divided into two nearly equal main parts by a row of three square piers. At the rear is a small area, apparently used for the admission of light and originally separated from the main hall by two wooden columns of which the circular stone bases alone remain. The outer portion of this hall is entered on two adjoining sides between square piers, and these were preceded again by a colonnade of which the circular disk-like bases remain (Figure 35). The Throne Room is chiefly remarkable for the perfectly preserved high-backed stone seat which gives it its name. It consists of a deep outer hall or portico (entered through a colonnade) and the main apartment, on one side of which is the throne. Opposite the throne is a light-area separated from the main room by columns.

The palace shows interesting remains of a complicated

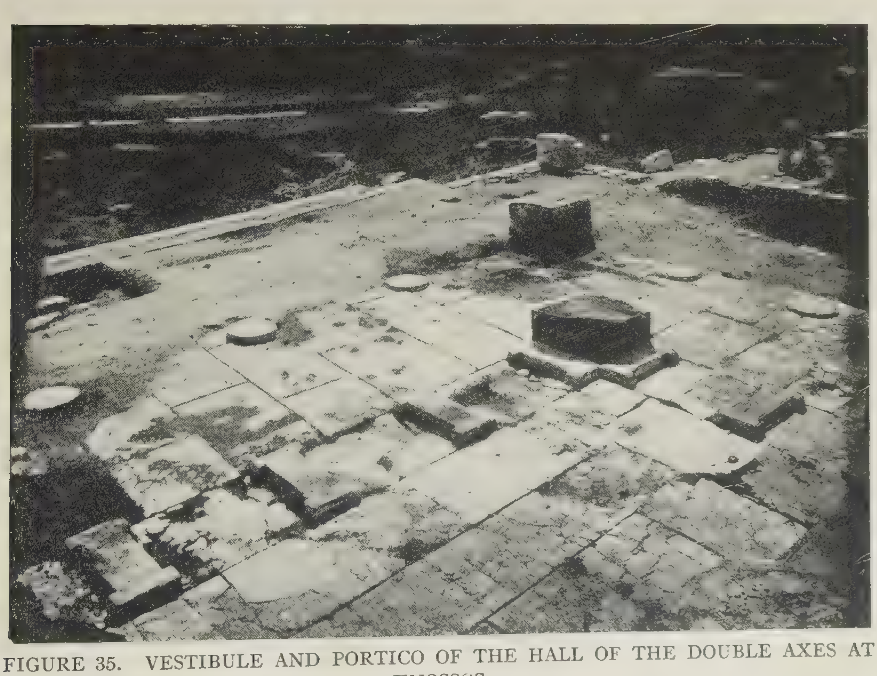


FIGURE 35. VESTIBULE AND PORTICO OF THE HALL OF THE DOUBLE AXES AT KNOSSOS.

drainage system and drain pipes, suggestive of a remarkably modern treatment of the sanitary arrangements of the complicated group of many-storied buildings. The stone work is admirable but there is little evidence of any architectural membering or elaboration of form. The most important architectural feature is that of the wooden columns. The palace was destroyed by a severe conflagration. But few charred fragments of its woodwork therefore remain. The circular disk-like bases or circular sockets alone indicate where columns once stood. Circular columns are, however, clearly shown in the wall paintings, and these make it tolerably certain that Evans' restoration of the colonnaded stair hall is substantially correct. The noteworthy characteristics of these columns are that their circular shafts taper downward, and that they are surmounted by a wide square block, or abacus, supported by a heavy, bulging, circular, cushion-like member, the echinus, which forms the transition between shaft and abacus.

This form of column is similar to that found at Mycenæ and is of importance in its relation to the later development of the Greek Doric column.

The walls of the room were plastered over with stucco, and were decorated with fresco. The decoration makes use of the Egyptian lotus but treats it in a free way wholly original. It employs also the spiral or guilloche and the rosette in a way that reminds of some Egyptian borders. In the main, however, the decoration, like all the Cretan art, shows characteristics wholly its own. It appears to owe little to outside sources.

This wonderful palace was destroyed about the year 1400 B.C., evidently as the result of a sudden attack which implies that the sea-power of Crete had been broken. After that epoch it ceased to be of great importance. The site was partially reoccupied, but the greatness of Knossos had departed and the decline set in rapidly.

Who the destroyers of Knossos were cannot be known, unless some day the deciphering of the Cretan clay tablets should give a clew.

During the latter part of this period, Greece itself became the seat of a similar civilization evidently deriving much from Crete, indeed showing a development clearly due to the Cretan impulse; but having an architecture whose fundamental forms of plan and arrangement show a different character. It is the epoch known as Mycenæan from the town of Mycenæ, which, together with Tiryns, Argos, Orchomenos, Athens, was prominent at this period, and whose ruins have revealed to modern exploration more with regard to it than any other site. On the opposite shores of Asia Minor a similar, but partly independent, civilization existed, and was represented especially by Troy, the Troy of Homer, in the sixth city that had stood on this ancient site, continuously occupied from neolithic to Roman times. It is this Mycenæan civilization of which the reflection, if not the direct description, is given in the Homeric poems. It is not without real significance that some of the existing remains are associated with the names of Atreus, of Agamemnon, and of Clytemnestra.

Whether this civilization was really that of a people of Greek race or not, whether it is to be ascribed, as some archæologists still maintain with much force, to that first wave of Greek immigration, the Achæan, coming down from the north, has become more than ever a matter of dispute. It is clear however that whatever the racial character of the people, it was one of the important elements that entered into the composite formation of the subsequent historic Greek nationality. It is still more clear that in Mycenæan art we find the beginnings of the subsequent art of historic Greece.

Each little community was ruled over by a chief or king, whose kingdom was often no larger than the single valley, usually opening toward the sea, in which his city was built. Indeed Argos, Mycenæ, and Tiryns, all in the single valley at the head of the Gulf of Argos, may at one time have been ruled by opposing chiefs. The occupation of the people seems to have been mainly agriculture; but the wealth of the kings came probably largely from the sea. From the sea also attack was to be feared, as well as from the land across the mountains. There is no evidence of any such sea-power as that of Crete. The home of the king must therefore be built on a site easily defended. The principal buildings were inevitably the castles of the kings. The favorite position for these fortified citadels was on a rocky hill near the head of a valley leading toward the sea, near enough to the sea to be accessible to it, but far enough to oblige marauders to leave their ships. Such is the situation of Mycenæ, Argos, Corinth, Athens. Troy was built on a hill not far from the sea, some one hundred fifteen feet above sea level and dominating the surrounding plain. Tiryns has a similar situation but on a hill about half as high. The people seem to have lived chiefly in open villages near enough to the citadel or acropolis so that they could take refuge within its walls in case of sudden attack. It is doubtful whether the houses clustering about the hill on which the castle stood were protected by any town wall.

The fortification walls of the palace followed the irregular outline of the top of the hill. These walls were high, from twenty to thirty feet in thickness, and were built either of huge unhewn or roughly dressed boulders, often six to ten feet long and three feet in height with the joints filled with small stones laid in clay, — the form of masonry technically called Cyclopean, because of the fable that such walls were the work of the Cyclops, — or they were built of squared blocks laid without mortar. The Cyclopean masonry is undoubtedly the older in origin, but both methods seem to have been used at the same time. The polygonal masonry, such as the fragment of wall fifty-four feet high at Mycenæ, is in all probability of Greek origin. The top of the acropolis of Athens, some five hundred feet above sea level, is about one thousand feet long and five hundred wide. That of Tiryns is of about the same length but hardly more than three hundred feet in width at the widest point. The citadel of Mycenæ is more irregular. The hill top is roughly triangular. It rises nine hundred feet above the sea, a spur from mountains which rise behind it to a height of over two thousand feet, and is nearly twelve hundred feet long by over six hundred feet wide at the widest. The enclosing walls of these areas included the palace of the king and the houses of his retainers.

While Mycenæ has yielded the richest and most abundant examples of Mycenæan art, the remains of the palace at Tiryns are more complete, especially as to the arrangement of the plan (Figure 36). This palace is therefore chosen as representative of the period. The hill of Tiryns stretches nearly north and south and the approach to the citadel is by a ramp on the eastern side running along the wall so that, marching up the ramp, soldiers would expose their right or spear side to the wall, while the shield side, the protected side to the left, would be away from the wall. The road then turns sharply at right angles and passes through the wall, at this point some twenty-six feet thick. The road within runs close along the wall, downward to the right to the northern lower portion of the citadel occupied probably by the dwellings of the king's retinue, and upward to the left leading to the palace proper. In each case it passes between the outer wall and the great inner retaining wall which supports the upper terraces. Passing southward through a second gate it continues upward in the same direction until it opens on an outer court to the right of which was the monumental gateway, about forty-six feet wide, of the palace itself.

As is the case with all the rest of the palace, only the foundations of this gateway remain. Its plan is remarkable and important, for we have here the prototype of the Greek gateways or propylæa, leading to the temple precincts and acropolis of later historic times. Indeed the plans of the later gateways are almost identical with those of Tiryns. The gate itself is pierced in a cross wall with flanking walls, between which, within and without, are columns forming an outer portico of the type known in later Greek architecture as "distyle in antis"—*i.e.* having two columns between the wing-walls. The "anta" is the flat, pilaster-like member which forms the end of the wing-wall. In Mycenæan buildings this anta was formed by planks secured by tenons into sockets in the stone base. The evidence of this is to be seen in the portico-in-antis of the great hall, or *megaron*. On the other side of the gate is another portico, but without columns. Through this gateway the first or outer, somewhat irregular, court of the palace itself is reached.

Turning to the right as one enters, one passes through a second monumental gateway, of the same type as the first,

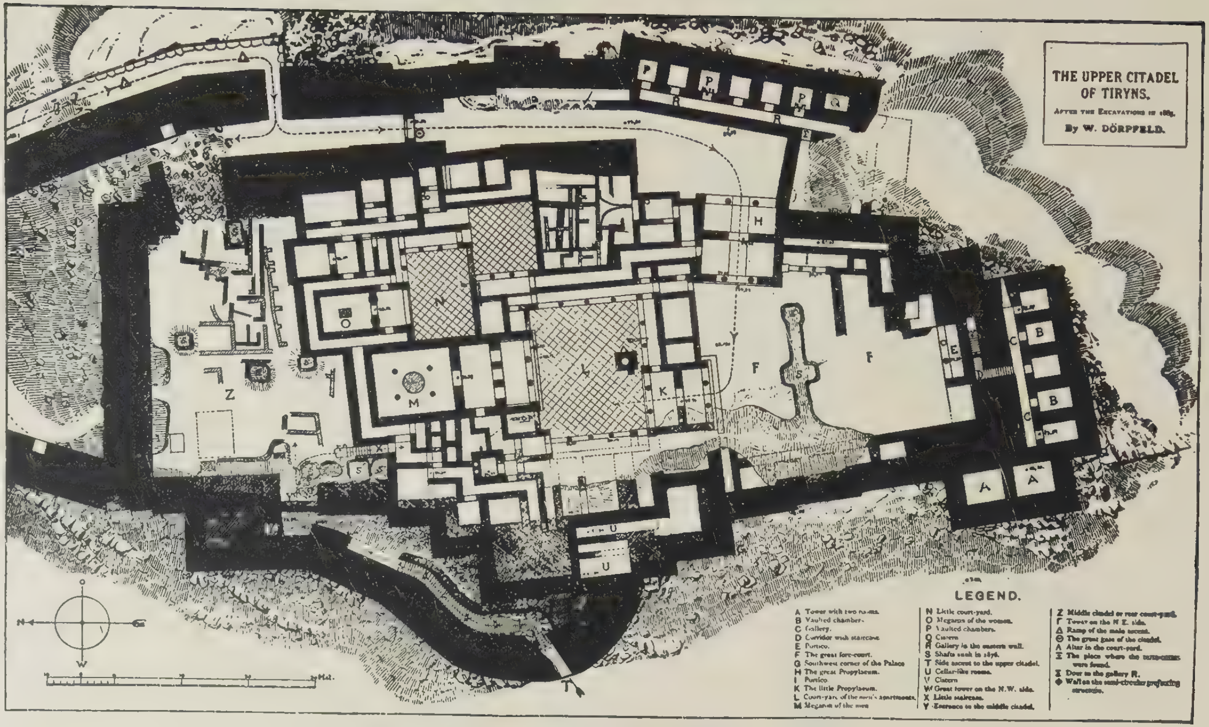

THE UPPER CITADEL OF TIRYNS.
AFTER THE EXCAVATIONS IN [illegible]
By W. DÖRPFELD.
LEGEND.
A Tower with two rooms.
B Vaulted chamber.
C Gallery.
D Corridor with staircase.
E Portico.
F The great fore-court.
G Southwest corner of the Palace
H The great Propylaeum.
I Portico.
K The little Propylaeum.
L Court-yard of the men's apartments.
M Megaron of the men
N Little court-yard.
O Megaron of the women.
P Vaulted chambers.
Q Cistern
R Gallery in the eastern wall.
S Shafts sunk in 1876.
T Side ascent to the upper citadel.
U Cellar-like rooms.
V Cistern
W Great tower on the N.W. side.
X Little staircase.
Y Entrance to the middle citadel.
Z Middle citadel or rear court-yard.
Γ Tower on the N.E. side.
Δ Ramp of the main ascent.
Θ The great gate of the citadel.
Λ Altar in the court-yard.
Ξ The place where the terra-cottas were found.
Σ Door to the gallery R.
Φ Wall on the semi-circular projecting structure.
N
O
W
A
B
C
D
E
F
H
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FIGURE 36. PLAN OF THE ACROPOLIS AT TIRYNS.

From the drawing by W. Dörpfeld in H. Schliemann's "Tiryns" (1885), Fig. 125.

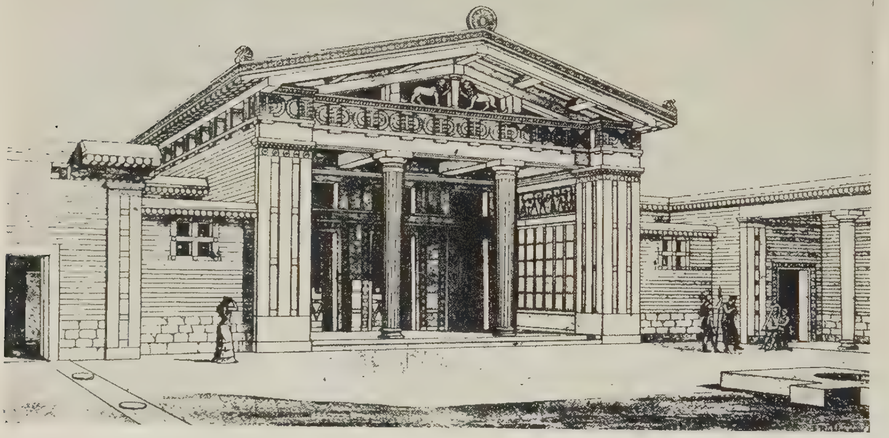


FIGURE 37. PORTICO OF THE MEGARON IN THE COURT OF THE PALACE AT TIRYNS, RESTORED.

From a drawing by J. Bühlmann.

but somewhat smaller and with the colonnaded portico within as well as without, into an inner court, the main courtyard of the palace. It forms a rectangle fifty-two feet by sixty-six feet, paved with a thick concrete of lime and pebbles and carefully sloped to shed the rain-water to a catch-basin in the south side. This court, entered near one corner, is nearly surrounded by colonnaded porticoes of differing scale and irregular arrangement. It is evident that the open court is merely the space about which the main apartments are grouped. It is not clearly conceived as an architectural entity. Its plan has, therefore, an accidental quality, quite different from some of the Cretan courts (as at Haghia Triada) or from the monumental forecourts of Egyptian temples. It contains the germ of the colonnaded courtyards of Greek houses, and it foreshadows also, but on a smaller scale, the arrangement, often similarly irregular, of the Greek agora or market place. At the centre of the southern side of the court, near the gateway and opposite the entrance to the king's hall, stands an altar.

Directly in the centre of the northern side, the side opposite the gateway, is the portico of the chief apartment of the palace, the megaron, — the great hall, the men's meeting place, the hall of the king (Figure 37). This open porch, like that of the gateways, is distyle in antis and leads through three doorways to an enclosed vestibule or antechamber from which a single door leads to the megaron itself, a room about thirty-one by forty feet. In the centre can still be seen the circular hearth. About it four circular disk-like bases, similar to those of Knossos, mark the position of four columns which originally supported the roof. The whole arrangement of this hall, the main apartment of the house of the king, is similar in general scheme to that of the later Greek temple, the house of the god.

The arrangement has certain analogies with the halls of Knossos, especially in the sequence of porch, antechamber, and hall; but the plan is more regular and the light-well at the back, which is constantly found in the Cretan palaces, is here wanting. The type is after all a different one. The plan indeed more closely resembles that of some of the Beni-Hassan tombs than anything to be found in Crete; but it is probably, as Leroux maintains, of indigenous Greek origin and due to northern rather than to southern influences.

We have here essentially a long narrow apartment entered at one end, preceded by a portico and covered — there is little doubt — with a gable roof. The entrance necessarily is below the gable. It is a type essentially Greek, differing radically from that of Crete, as well as from the broad colonnaded hall of Egypt or the shallow apartment of Mesopotamia, both of which, as we have seen, are entered on the long side. The Greek megarons stand separate from one another, in order that the rain shed from the sloping roofs may be freely carried away and not be gathered in valleys difficult to make tight, — an arrangement clearly pointing to the use of the gable roof. The building is capable of extension only by additions at front and rear. It is not a type which lends itself to the agglomerative plans of Egypt, Mesopotamia, or Crete.

The type had existed in Greek lands since the earliest prehistoric times. Its history can be traced continuously from the oval hut of the stone age, itself a structural imitation of the cavern, through the whole course of development up to the megaron of the Mycenæan palace and so to the Greek temple which is derived from it (Figure 38). Even the interior subdivisions foreshadow those of the temple, for the columns and piers constitute practically two rows of supports forming three aisles.

The course of this development may be briefly traced as follows: The simple oval hut, undoubtedly with curving roof, as at Orchomenos, sometimes receives two columns in its open front, a type which survives in early Dorian times in the sekos of Gonnoi. Its sides then become straight and the triangular gable roof is doubtless adopted, although the oval or apsidal end remains for some time. The more easily to support the ridge of the gable roof, a single row of columns is placed along the central axis, a device already found in Mycenæan Troy which persists after the Dorian invasion. A portico is added in front, often an inner chamber to the rear, and the developed Mycenæan type is thus evolved.

At Tiryns adjoining the court of the men's megaron are the two courts of the women's apartments. Each has a colonnaded portico of two columns on one side only. On the northern side of the inner court is the women's hall, again an isolated structure, preceded by a single deep porch without columns. It is smaller than that of the men (twenty feet by twenty-six and one-half feet) but save for the absence of columns is similar in arrangement. Many of the smaller palaces and great houses have, like the women's quarters at Tiryns, a megaron with a portico but without the antechamber. The women's hall is surrounded by a corridor, entered from its vestibule from both sides, by means of which there is connection with the passage behind the men's megaron and with a series of secluded chambers, of which the largest, nearest to the women's hall and preceded by an antechamber, is probably the royal chamber. There is access to the palace also by means of a postern gate in the centre of the western wall opening into a steep staircase winding

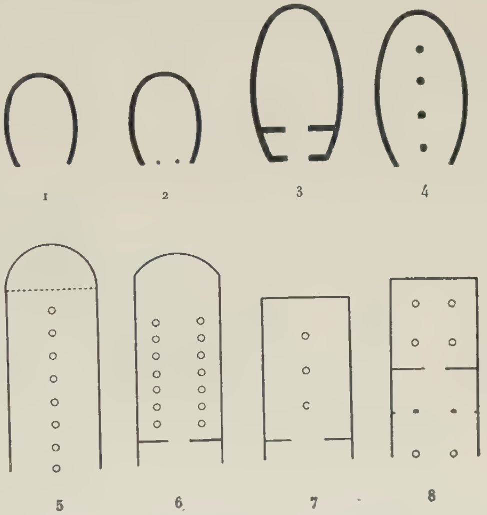


FIGURE 38. EVOLUTION OF THE OVAL HUT TOWARD THE FORM OF THE MEGARON WITH THREE AISLES.

From G. Leroux's "Les origines de l'édifice hypostyle" (1913), Fig. 10.

1. Hut at Orchomenos.
2. Sekos of Gonnoi (Dorian period).
3, 4. Navetas of Minorca.
5. Bouleuterion at Olympia, north wing (Dorian period).
6. Kabirion at Samothrace.
7. Megaron from Mycenæan Troy.
8. Megaron at Tiryns.

upward against the wall and finally leading to the irregular passages behind the megaron.

The walls up to the height they exist — usually about three feet, in places somewhat more — are built of rubble stone or roughly hewn blocks laid in clay. The rubble stone was in places bonded with timber laid lengthwise of the wall. There is evidence that above this the construction was of sun-dried brick, doubtless also bonded with timber. Indeed it is to the brick technique that timber bonding belongs. The doorposts and probably the lintels were of timber. The thresholds were sometimes of wood, but more often of stone. At Tiryns usually a close-grained limestone or sometimes a hard conglomerate was used. The walls were plastered within and without with clay which was then covered with a coating of lime plaster and colored. The walls of the rooms were often richly decorated in fresco. A fragment of a frieze from Tiryns represents precisely the form of bull-baiting shown in the decorations of Knossos, and the drawing of the bull as of the man leaping over his back is strikingly similar. Another painted frieze shows men-at-arms on horseback. Similar subjects occur in the vase paintings. Some of the borders show spiral patterns, often strikingly resembling some of those of Egypt, as well as the rosette pattern which so often occurs in Assyrian palaces. Both of these forms are familiar in Crete. A very characteristic decoration is a frieze made of alabaster slabs covered with peculiar palmetto forms which may have been suggested, or more or less remotely derived, from Mesopotamian examples, but which have a quite distinctive character (Figure 39). These were sometimes enlivened with an inlay of blue glass-paste (the Kyanos of Homer's descriptions). There is evidence that the lower part of the walls of the megaron of Tiryns were lined with alabaster slabs.

It seems clear that the columns employed, as at Knossos, were generally of wood. The form is not open to doubt. A column is represented over the Lions' Gate at Mycenæ, presently to be spoken of, and shafts of stone columns have been found flanking the entrance of some of the tombs (Figure 40). They are all of the same general type shown in the wall decorations at Knossos and restored there by Evans. The beams undoubtedly were also of wood. It is the same form of construction as that indicated by the Beni-Hassan

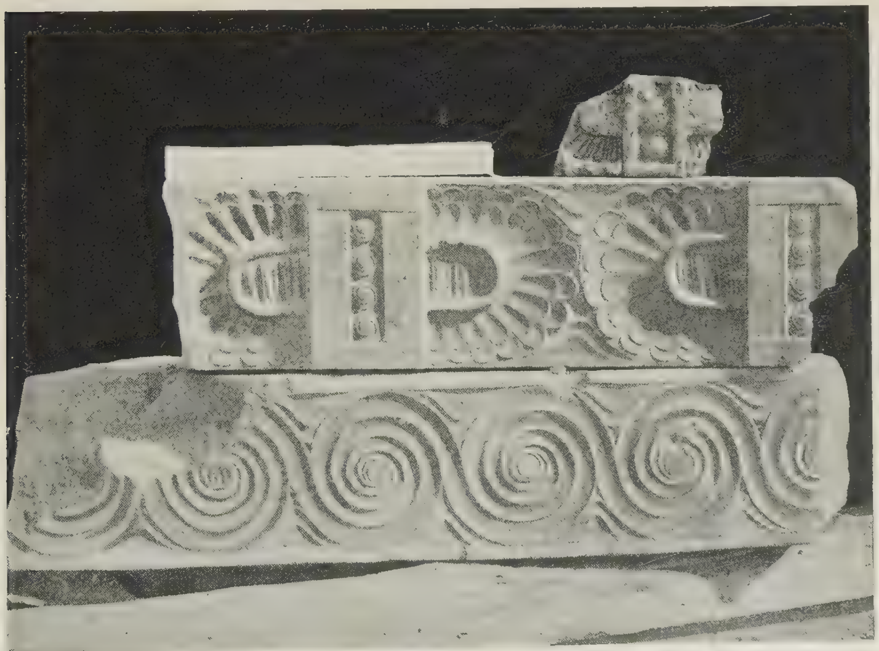
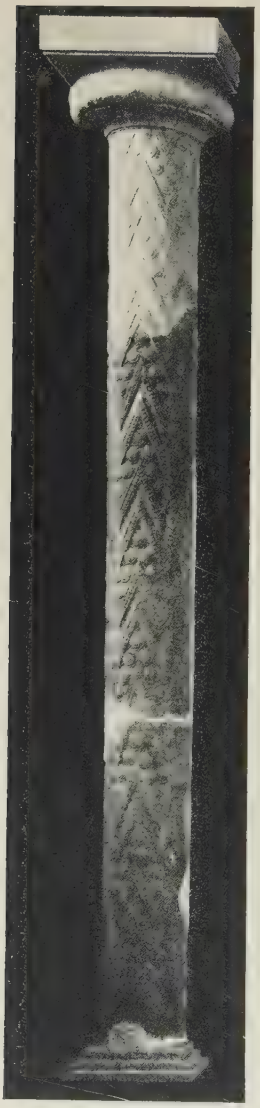


FIGURE 39. SCULPTURED FRIEZE FROM MYCENÆ, IN THE NATIONAL MUSEUM AT ATHENS.



tombs in Egypt, and by rock-cut tombs in Lycia which clearly reproduced wooden construction.

One of the most interesting features of the citadel of Tiryns is a series of chambers opening from galleries ranged along the outer wall at the southern end, beyond the palace to the east and south. The approach to the southern gallery alone remains. It consists of a staircase leading in two flights down from the great outer court. The galleries, or corridors, like the compartments (probably store-chambers) opening from them, are built of colossal roughly hewn stones and are roofed over by gradually approaching the courses on each side, which are rudely bevelled off so as to form, as it were, a triangular vault (Figure 41). The principle of construction, it will be observed, is not that of the arch but of the corbel or cantilever, the joints of the stone work being horizontal. The postern gate in the western wall has a similar triangular opening spanned on the principle of the corbel. Such an opening might be called a corbel-arch or corbel-vault.

The same principle of construction is found in several important structures at

FIGURE 40. COLUMN FROM THE "TREASURY OF ATREUS" AT MYCENÆ, RESTORED FROM FRAGMENTS IN THE BRITISH MUSEUM AND THE NATIONAL MUSEUM AT ATHENS.

Mycenæ; in the tombs and in the Lions' Gate, the great entrance of the citadel (Headpiece to Chapter IV). The road approaching the citadel of Mycenæ leads along the wall in an angle of the western end, and finally runs between the wall and a huge bastion which projects so as to command the approach, at this point some thirty-five feet wide and closed here by a cross wall in which is the great gate through which the road passes. The masonry is of enormous hewn blocks of stone, varying from three to six or even nine feet in length, the courses being about two and a half to three feet in height. The gateway itself is formed of two

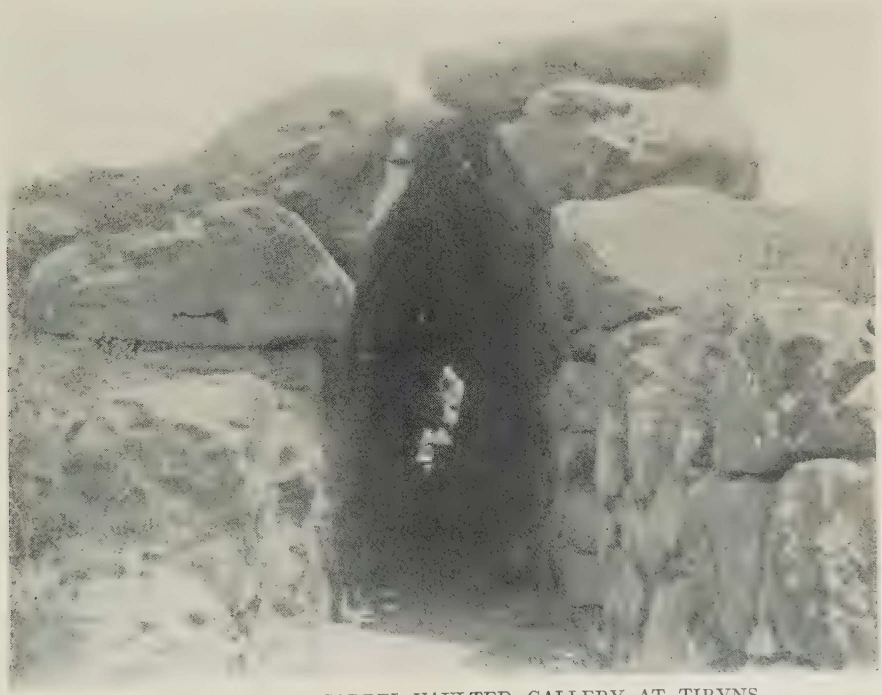


FIGURE 41. THE CORBEL-VAULTED GALLERY AT TIRYNS.

upright jamb stones spanned by a great lintel. The jamb stones incline slightly toward each other so that the opening of the gate, which is about ten feet and a half in height, measures approximately ten feet and three inches in width at the bottom and nine feet and four inches at the top. Over the lintel is the great low relief which gives the gate its name. Two lions stand opposite each other with their fore-legs on an altar upon which stands a downward-tapering column with a capital like those of Knossos. Its bulging echinus has below it a hollow moulding, a cavetto, and carries a square and very high block, upon the face of which are carved four disks as if to represent the ends of poles resting on the abacus, the upper part of the block suggesting the edge of the flat roof. On this interpretation the lintel or beam is omitted. The column is doubtless the symbol of the palace, and there is evidence that the column, the pillar of the house, was an object of worship, hence the altar on which it is represented as standing and the guardian lions, now headless, but originally with bronze heads facing outward. The whole bas-relief was doubtless originally richly colored. Possibly the lions, including their bronze heads, may have been entirely gilt. Similar motives are to be seen on Cretan seals. This remarkable low relief is carved on a single slab which fills a triangular opening over the lintel of the gateway. This opening is formed by corbelling like the galleries at Tiryns, but the blocks are here more regularly cut. The postern or water gate at Mycenæ is of similar post-and-lintel construction, but without the triangular relieving opening and its closing slab.

Of the same type as the Lions' Gate, though quite different in size and proportion, is the doorway at the entrance to the most important of the tombs of Mycenæ (Figure 42). These tombs are built into the slope of the hill outside the citadel. They are of the kind known from their circular plan and the domical outline of their main chambers as beehive tombs, from the general resemblance of the form to the old-fashioned straw beehive. Of this type of tomb some twenty-five examples are known in different portions of the Greek lands from Bœotia to Crete. Of these eight are at Mycenæ. Of all these the most important and the most stately is the tomb of Mycenæ known as the "Treasury of Atreus" or the "Tomb of Agamemnon." Another goes by the name of "Tomb of Clytemnestra."

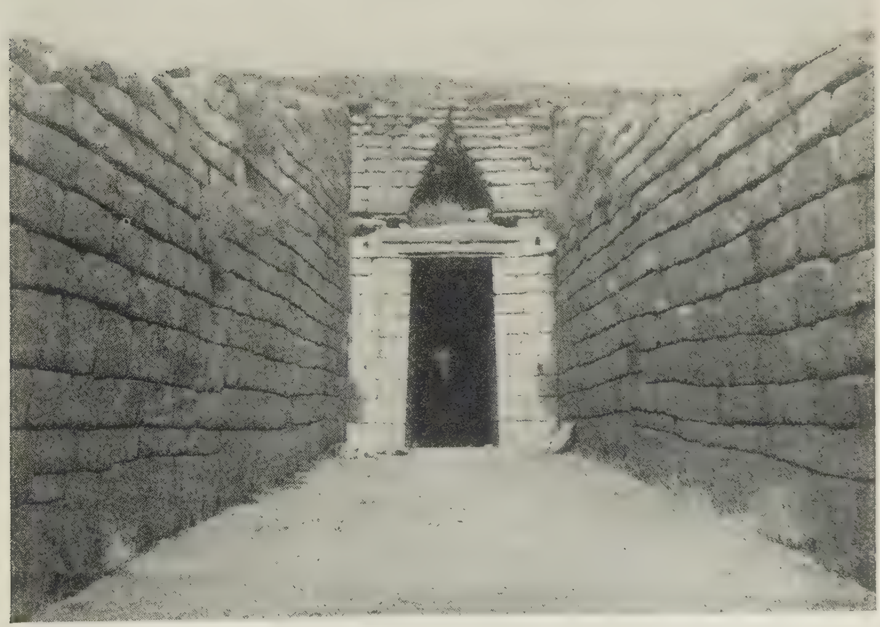


FIGURE 42. ENTRANCE TO THE "TREASURY OF ATREUS."

There can be no doubt that they were the tombs of the royal family that reigned at Mycenæ.

Each of these tombs, constructed within the hillside, is approached by a long passage-way called the *dromos*, which leads to the main circular chamber, the *tholos*, from which a rectangular side chamber opens, hewn in the rock. The sides of the dromos of the tomb of Agamemnon are lined with walls of squared blocks. The dromos is twenty feet wide and one hundred and fifteen feet long and its vertical sides rising from the slope of the hill are at the end some forty-five feet high. One of the great blocks of the retaining wall at the side measures twenty feet long and four feet high, but the average height of the courses is about two feet. This passage ends in the main façade of the tomb occupied chiefly by the great doorway. Its clear opening is seventeen feet nine inches high and eight feet nine inches wide at the ground and eight feet one inch at the top. The opening therefore, as in the Lions' Gate, has an upward diminution, in this respect, as in its general proportions, resembling the temple doorways of historic Greek times. Its enframement of two slightly receding fasciæ cut in the stone courses also resembles the treatment of doorways in historic Greece. The passage of this doorway to the tholos is seventeen and a half feet deep. Its ceiling, which, owing to the curve of the tholos dome, is still deeper, is formed by two enormous lintel slabs of which the inner one is twenty-nine and a half feet in length (in the direction of the span), sixteen and a half feet in breadth and three feet four inches in thickness. The doorway was flanked by two half-columns of dark grey alabaster of the Knossos type, of which the bases — in this case rectangular — remain in situ, while fragments of the shaft and capital were found, richly decorated with surface carving of running spiral bands forming a chevron or zigzag decoration on the shaft. Above the great doorway is a triangular opening formed like that of the Lions' Gate. It is now open but must originally have been closed in some way, perhaps by an enriched bronze plaque.

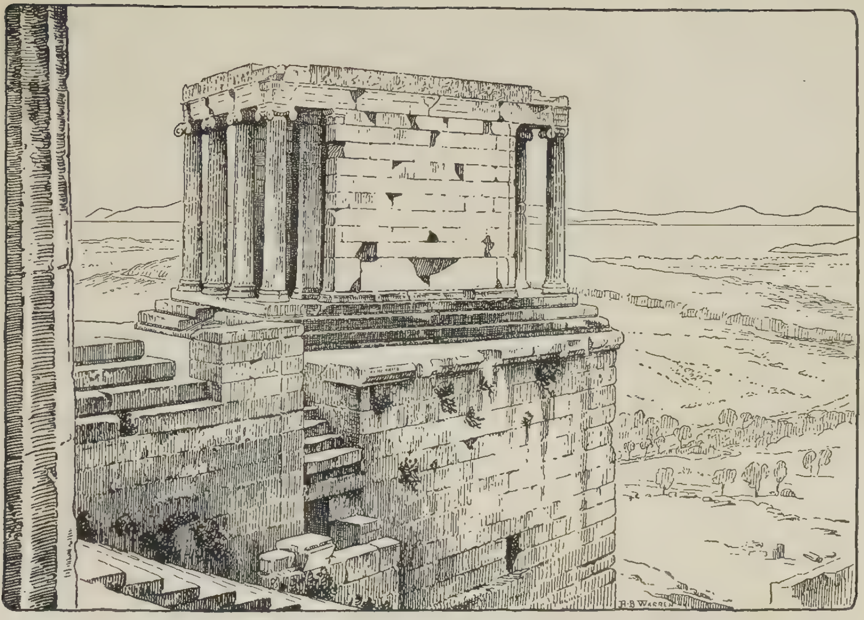
The tholos has a diameter of about forty-eight feet and it is of about the same height. As already intimated it has within the form of a pointed dome, and seems so far as eye can detect to have the domed construction. The beds of its courses, however, do not radiate, but are horizontal; the principle of construction, therefore, is not that of the dome, but of the corbel-vault. Its sides show remains of bronze dowels which indicate that the interior was decorated with bronze plates or bronze ornaments, perhaps rosettes, at intervals. The bare description brings before us a monument of imposing proportions and impressive character.

The side chamber of the Tomb of Agamemnon, about twenty-seven feet square and nineteen high, has no features of special interest, but the similar, somewhat smaller chamber of the beehive tomb known — at least since the days of the Greek traveller of the second century of our era, Pausanias — as the "Treasury of Minyas," at Orchomenos in Bœotia, had a carved alabaster ceiling of great beauty, of which fragments still remain. Its pattern is similar to that of one of the wall decorations at Tiryns.

The palace at Mycenæ occupies a relatively smaller area of the citadel than at Tiryns, and the remains are more fragmentary. The form of megaron is still clearly to be discerned. It was larger but in all essential respects similar to that of Tiryns. One unusual feature is worthy of notice. The palace occupies high ground in the centre of the citadel. The position prevented the use of a monumental propylæum as at Tiryns. What was apparently the main entrance to the palace is a simple doorway leading into a small court with stone benches on its sides from which a stairway nearly eight feet wide leads upward in one straight run to the principal court of the palace. Twenty-two of the ample steps, fourteen to eighteen inches wide with a rise of four or five inches, are still in place. These steps are made up each of three or four blocks of hewn poros stone set end to end and so thickly coated with plaster as to hide the joints and give the impression of solid work.

Mycenæan pottery and metal-work, jewellery, gold and silver cups, arms and armor show even closer affinities with the ancient Cretan art than does the architecture and indicates a civilization hardly if at all inferior.

The rediscovery of the remains of this ancient civilization fully justifies and confirms Homer's descriptions of the palaces of his heroes.



From a drawing by Harold B. Warren.

V

GREECE

The remarkable civilization exemplified by Tiryns and Mycenæ was overthrown, in all probability, by the invasion of rude Greek tribes from the north, among whom the Dorians were the most prominent. It does not seem to have been a sudden catastrophe, but, like the German migration of later times, was a movement of population which lasted several centuries, one wave of invasion following another and including several tribes. Indeed, the legends which obscurely reflect the history of this period seem to indicate that the invaders were made up of many elements. The centre of this period of change was probably about the year twelve hundred before Christ. The Dorian Greeks were much less civilized than those whom they conquered, but they possessed superior weapons — swords and spears of iron, not of bronze. Resistlessly they pressed forward, in the end occupying the land completely. There is clear evidence that the Mycenæan palaces were destroyed by fire and that they were plundered before destruction. The inhabitants were partly driven out and partly brought into subjection to the conquerors, remaining chiefly as serfs and tillers of the soil. In the process, however, the conquerors became more civilized by contact with the superior civilization they had overthrown. Many elements of the older civilization were assimilated and formed an important part of the material out of which the new civilization was gradually built up.

During this period of change the Phœnicians, a Semitic race occupying the coastland of Syria, were prominent as a maritime power. Already shortly after the fall of Knossos they became in all probability the strongest sea-power of the Eastern Mediterranean and their commerce served to continue the intercommunication of the peoples of this region, of Egypt, of Assyria, and of the Ægean countries, during the period in which the sea-power of Greece as yet hardly existed. But the Phœnicians never seem to have had an important art of their own. The scant remains of their civilization seem to show that they were always borrowers rather than originators, and the part they played in bringing Egyptian and Eastern influence into Greece was clearly less important than that of the Cretans or of the Ionic Greeks themselves.

The shifting of population during this dark period is too obscure, the evidence on which to base definite statements as to the movement too much in dispute, to make either possible or profitable any attempt at more than an indication of th great changes which finally produced the Greek world of historic times.

When the darkness gradually disappears, when through the obscurity definite historic events begin to emerge, we find the Greek peoples mainly distributed about as follows: The southern part of Greece was held by the Dorians, among whom the Lacedæmonians in Sparta were dominant. They formed everywhere in the Peloponnesus the ruling element, the earlier population being held in subjection as Helots or serfs. The coast of Asia Minor was occupied chiefly by the Ionic Greeks, a people probably of composite origin, formed partly of Greek peoples who very early crossed over from the mainland of northern Greece, partly of refugees driven out by the Doric invasion, in part perhaps also of other Greek colonists who at various times crossed the sea, many of them coming from Attica, in part also of non-Greek elements, some of them indigenous to the soil. Ionia, as this coast came to be called, seems early to have absorbed the remnants of the Mycenæan civilization and it thus advanced again toward a higher development sooner than the rest of Greece. It is to this period of reflex and decline of Mycenæan civilization in Asia Minor that the Homeric poems are to be ascribed. Earlier than other Greeks the Ionians developed maritime power, indeed the evident circumstances of their origin point to them as a seafaring people. They occupied most of the eastern islands and a fringe of coast along the mainland of Asia Minor. They never penetrated inland, where the country was occupied by various non-Greek populations, Caryans, Phrygians, Lycians, Lydians, who were influenced by the Ionic civilization quite as much as they influenced it. The fact that the

Greek peoples along the coast were only a thin fringe, in itself points to the fact that they must have been immigrants who arrived from the west across the sea. The Æolian Greeks, chiefly to the northwest, form a less important group. The chief Greek peoples in historic times were the Dorians, with their allies and dependents, and the Ionians.

Attica evidently preserved much of the Mycenæan or — if we may say so — Achæan element. Its people boasted that they were autochthones, of the soil, and that alone of the Hellenes they had not shifted their abode. It seems to have been largely passed over by the Dorian invasion, and it had close connection with Ionia, regarding itself indeed as the original seat of the Ionic race. It is not impossible that a reflex wave of immigration came to it from Ionia. The Attic race was however clearly of mixed origin, containing not unimportant Doric as well as Ionic elements. To this it owed its distinctive character and its wonderful accomplishment.

The Greek peoples, of diverse origin, were, like their predecessors, separated into a series of small independent communities, among the Dorians ruled over usually by kings, often with limited power, among the Ionians generally developing city republics, frequently showing oligarchical tendencies, or falling under the dominance of individual despots. The varied political developments of these small states did not greatly affect the architecture. Increasingly they became maritime, and as early as the eighth and seventh centuries both Ionian and Dorian colonies found their way first into Sicily and South Italy (Magna Græcia) and then into the Black Sea. The laws of Lycurgus at Sparta are ascribed to the close of the ninth century before Christ, and Greek history may be said to begin with the first Olympiad, the traditional first celebration of the Olympic games in 776 B.C.

It is to about this time that may be ascribed the first architecture definitely to be called Greek. At its first appearance this architecture, comparatively crude as yet, has nevertheless a perfectly definite and pronounced character.

Two distinct types of this art are to be distinguished, the one established chiefly on the Ionic shore of Asia Minor, the other in the lands dominated by the Dorian race. These are known respectively as the Doric and the Ionic styles. Both developed from similar inherited Hellenic elements, but the one drew more of its early inspiration from Egypt, the other grew to perfection chiefly under Asiatic influences. These styles, although contemporaneous in development, it will be clearer to consider separately.

THE TEMPLE

At once we are faced by the fact that the important building is no longer the palace of the chief or king, but the temple of the god. It is not without significance that at Mycenæ, as at Athens, over the levelled ruins of the royal palace has been built in later times a temple. Whatever the form of government, whether a modified monarchy, a republic, or an oligarchy, the people, the body of recognized citizens of the city state (below whom to be sure is the large class of slaves), have now an importance which did not belong to them in earlier times. Greek history deals, not with the fate of kings and royal families, but with the relations of peoples and the development of constitutions. The people think of themselves as guided and overruled by the gods.

Each city has its patron god or goddess. Each event of their lives, each great phenomenon of nature — sowing and reaping, the vintage, marriage, birth and death, their commerce, their art, the sea, the thunderstorm — is controlled by, or is the expression of, some potent deity. Every tree and spring and mountain has its indwelling spirit. The world is peopled not only with men and women, but with nymphs and dryads, fauns and satyrs. And these gods and goddesses are not thought of as remote, but as, for the most part, companionable beings, coming in contact with men, living in their midst, directly causing and modifying the phenomena that envelop and control men's lives. They were beings to be propitiated and appealed to for protection and support in every enterprise, in every circumstance of daily existence. This point of view explains both the importance of the temple and much that is most characteristic in its architecture. In replacing the palace, the temple has adopted its most characteristic feature, the megaron, for is it not the house of the god? But this house, this great hall of the indwelling deity, is no longer remote and secluded. It stands open within its sacred enclosure surrounded by a protecting colonnade or portico, and through its great door the statue of the god may be seen by the passer-by. Without and in front of it, as in front of the megaron in the earlier palace, is the altar.

We may imagine that the first shrines, like many of the simpler later ones, consisted only of the cella or naos, the main chamber or sanctuary corresponding to the megaron of the palace, and the portico or pronaos corresponding to the porch of the palace, and like it usually distyle in antis, but in the smaller examples without columns. The vestibule or antechamber between the portico and the cella often occurs (as in so many Sicilian temples), it often also is omitted, as in many of the simpler megarons of Mycenæan times. This simpler arrangement prevailed on the Greek mainland and later became usual everywhere. But the Heræum at Olympia, the oldest Greek temple known, had (and seemingly always had) the surrounding colonnade — the peristyle — that most distinctive feature of the Greek temple, which marks the house of the god, giving it dignity and splendor. In another respect the temple differs from the great hall of the palace. The cella of the early temples (unlike the megaron) is excessively long and narrow. It is remarkable that in the course of its development it tends to revert more nearly to the proportions of the megaron from which it started.

The number of columns used on the front and sides varies in different temples (Figure 43). It is customary to designate buildings by the number of columns on the front, using for this purpose the Greek numerals. Thus buildings are known as *tetrastyle*, *hexastyle*, *octastyle*, *decastyle*, etc., according as they have four, six, eight, or ten columns in their front porticoes. It is obvious that a tetrastyle building can have no columns on the side. It must have a colonnaded portico on the front only, in which case it is called *prostyle*, or on front and rear, in which case it is called *amphi-prostyle*. With a larger number of columns it is usually a *peristylar* or *peripteral* building, — that is with a surrounding colonnade, sometimes double, or *dipteral*. The portico under such a colonnade is called the *pteroma*. Most Greek buildings had gables of low pitch, the gable being called a pediment. The field enclosed by the cornices of the pediment is called the tympanum. The pediments are obviously properly placed at each end of the building, thus marking the front and rear.

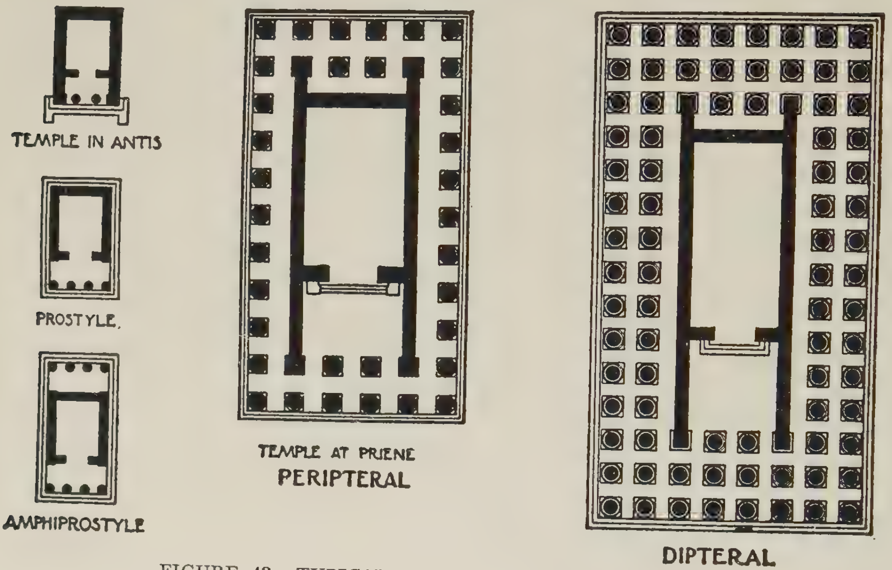


FIGURE 43. TYPICAL PLANS OF GREEK TEMPLES.
From a drawing prepared under the direction of the author for M. H. Morgan's Vitruvius (1914), p. 76.

The more detailed characteristics of the temple, which differ in each example and make of each an individual creation, will be considered later in connection with the study of the remains of the buildings. Before taking up this study, however, it will be well to be familiar with the fully developed forms of detail, both in design and construction, and with the general character of the changes which they underwent in the course of their history.

GREEK MOULDINGS

Some of the smaller members by means of which the articulations of the various forms of Greek architecture are accented or expressed merit early consideration, as universal and eternal elements in the language of architectural form. These smaller members are the mouldings which in the building take the place of introductory and connecting phrases in speech. They are continuous, narrow members of varied section, used to connect, to articulate, and to clearly express the members to which they are attached, or between which they are placed. They may be grouped according to function, their purpose being to aid in the poetic expression of structure. In making this grouping it will be convenient to bring together both the mouldings usual in the Doric style and those employed in the Ionic style (Figure 44), since some of these mouldings are used in both modes of design, and in the Attic style all of them appear, greatly adding to the richness of its vocabulary, and thus to its capacity for architectural expression.

We have first, then, the mouldings of footing, used principally to form a transition between the constantly recurring footing member, the plinth, and the wall or pier or shaft above it, and used also occasionally without the plinth

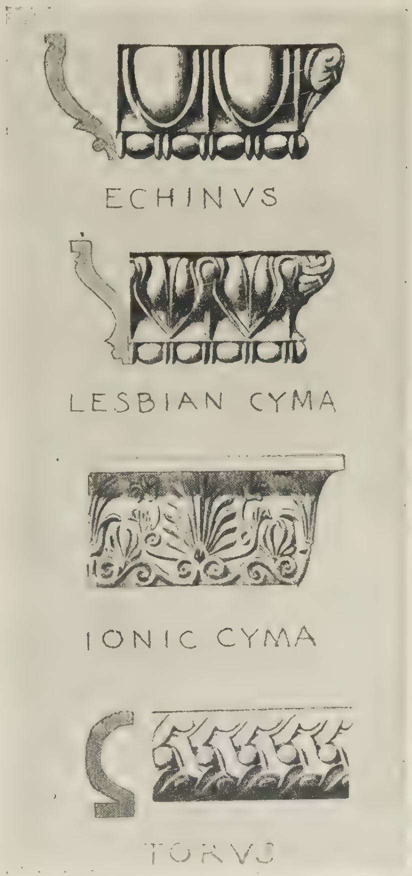


FIGURE 44. GREEK MOULDINGS.
From L. Reynaud's "Traité d'architecture," Vol. I (1860). Pl. 6.

for the purpose of expressing the function of footing. The principal Greek mouldings of footings are the *torus*, the inverted *Lesbian cyma*, and the inverted *Ionic cyma*. The plinth is the simplest expression of footing, but is hardly a moulding.

The torus is a moulding of half-round section used constantly in the bases of Ionic columns and in other situations, sometimes with and sometimes without the plinth below it.

The inverted Lesbian cyma has a section of double curvature, it is akin to the Roman inverted *cyma reversa*. Like nearly all Greek mouldings it differs from the Roman in the tenseness of its section of constantly varying curvature. It is usually on a smaller scale then the torus.

The inverted Ionic cyma has also a profile of double curvature, and is practically identical with the Roman inverted *cyma recta*. It is less often employed as a base-moulding and generally in minor architectural features such as pedestals or in sarcophagi.

The most usual mouldings of support are the echinus, the upright Lesbian cyma, and the *Doric cyma*.

The echinus appears chiefly in the capital of the Doric order and will be discussed in that connection. It has a certain kinship with the torus of footing. It is also used, especially in less tense forms, in other positions and on a smaller scale. It is a single curve of constantly changing curvature.

The upright Lesbian cyma is used chiefly as a minor moulding of support.

The *Doric cyma* or *beak-moulding* is usual on a still smaller scale than the Lesbian cyma. Besides indicating minor support, it has also especially the function of a drip for which doubtless it was originally devised. On account of the sharp shade or shadow under its overhang it is often used where it cannot serve the purpose of a drip-moulding, its dark hollow being useful where a distinct and clear horizontal emphasis is needed and would be otherwise difficult to obtain, as in groups of mouldings in shadow. It is used in this way in the anta capitals and in the mouldings supporting ceiling beams (Figure 46).

The mouldings of crowning or free ending have their most important position in the gutter mouldings or cymatia. They occur however also as the crowning features of groups of mouldings on a smaller scale, as in anta capitals, and over fasciæ in various positions, etc. The usual crowning mouldings are the *Ionic cyma*, the *Lesbian cyma*, the *echinus*, and especially on a smaller scale and in subordinate members the *fillet* or *tænia* and the *Doric cyma.*

The *Ionic cyma* is the most graceful and perhaps the most significant of the mouldings of free ending. It is used chiefly in the Ionic style, especially as the cymatium of the order. It hardly occurs in the pure Doric.

The *Lesbian cyma* and the *echinus* are the mouldings chiefly used for cymatia in the Doric style. They have the effect of finishing with greater firmness and rigidity than the Ionic cyma and so are in harmony with the general character of the Doric style. When so used their form is more flowing and much less tense than when these mouldings are used to indicate the idea of support. They both occur on a small scale as crowning members of subordinate features, with or without a terminal fillet.

The *fillet* or *tænia* is a continuous narrow band. It occurs as the crowning feature of intermediate members, as of the epistyle and the frieze. Its projection is usually equal to about half its height — less rather than more.

Besides these mouldings, which correspond to and are used in expressing the three main architectural functions, there is still another group of mouldings which are used to separate adjoining mouldings when used in groups and thus to give clearness of expression. These may be called mouldings of separation. They may be regarded as corresponding to conjunctions and prepositions in a sentence. The mouldings of separation are the *fillet* and the *astragal* or *bead*, to which may be added the *scotia.*

The *fillet* used as a moulding of separation is relatively narrower than when employed as a crowning feature. It is used also to terminate another moulding at the top and thus give it firmness of character which it would otherwise lack. Thus it is used constantly as the upper termination of cymatia mouldings. The fillet is the most important moulding of separation. When it is omitted between mouldings they tend to coalesce and thus become uncertain in expression. This weakness is occasionally to be observed in minor groups of Greek mouldings, as in some anta capitals. This is especially the case in the Ionic style.

The *astragal* or *bead* may usually be substituted for the fillet. It may have a semicircular section. Its profile is thus like that of the torus, but on a much smaller scale. Usually however it is about three-quarters of a circle in section. Sometimes instead of a fillet a rectangular sinkage is used, as to divide the Doric capital from the shaft. Such an incision is technically called a *quirk.*

The *scotia* might almost be classified as a moulding of footing, but it always occurs in combination. It is used to separate two toruses or other mouldings used in a base, and its form is quite as much determined by the expression of footing as by that of separation (Figure 94). Inverted it may occur in the separation of mouldings of other function. It is then apt to have a different name, as in the throat-moulding that occurs in certain early forms of the Doric capital. In such positions it is often called simply a *hollow.*

These mouldings occur not only singly but in groups. It is the grouping of mouldings that requires the use of the fillet, the astragal, and the scotia. The fundamental principles that underlie the grouping of mouldings are the same as those which determine the forms of the mouldings themselves. The groups are used to express function. In such a group it is desirable for clearness of expression that one moulding should dominate. The dominating moulding will be the one which more clearly and appropriately expresses the function in the given case. Unless there is such coördination and subordination confusion of effect is the result. These principles are sensitively observed in the composition of Greek mouldings, which are distinguished by the exquisite delicacy and precision of their profiles, as a rule of constantly changing curvature. They are always vital, never mechanical, in form.

An interesting example of such grouping is in the anta capitals. Since the anta terminates a wall its capital is a less important member of support than the capital of the free-standing column. These anta capitals are more simply and firmly composed in the pure Doric, than they are in the Attic Doric or in the Ionic style; but in either case the anta capital expresses the idea of support more delicately and more elaborately than the capital of the column.

The mouldings are in Greek architecture almost always decorated. In the pure Doric style these decorations are in color only, on the surface of the moulding. In the Ionic style the decorations are usually carved in relief before being colored. The decoration is always significant, never capricious. The Greek designer applied more concisely and systematically the principle already more vaguely apprehended by the Egyptian, that the dominant movement of the ornament applied to a moulding should be vertical or that its outlines should repeat the profile of the member decorated. By this means a harmony between the decoration and the form decorated is attained. The purpose of the decoration is not merely or chiefly to enrich, but to enhance the form and so accent the appropriate expression of the member decorated. It is obvious that vertical lines applied to mouldings must partake of the movement of the profile of the moulding and thus tend to emphasize its form. This accenting of the profile becomes more insistent when the profile itself suggests the outline or general movement of the applied ornament.

The decoration usual for the echinus was the *egg and dart*, of which the outline consists of reverse repetitions of the profile alternating with vertical lines. When this ornament is carved the outlines forming the oval are modelled like eggs, the verticals taking the form of darts, which gives to the moulding its name. It was probably derived from certain variants of the Egyptian lotus-flower and bud ornament.

The Lesbian cyma is decorated with the *leaf and dart* or *heart and dart*, the names of which are descriptive of the form.

The torus is more variously treated. It is very often left plain, but it may have a leaf decoration or it may be horizontally fluted, especially on the underside as if to emphasize the shadow, or occasionally it is cut up into a series of horizontal beads. It may also sometimes have the elaborate double spiral known as the *guilloche*, which by its interwoven pattern seems to hold in the swelling base. The double curvature of the guilloche as applied to the torus does not follow the principle above laid down, but the forms are small in relation to the profile and thus have the effect of a continuous surface decoration the binding quality of which gives it its significance.

It is obvious that any form of decoration may appropriately be applied to a vertical surface since it will not suffer distortion; but even here the principle above enunciated is constantly observed, especially where it is desired to emphasize the functional significance of the form. Thus a vertical fascia is constantly decorated with the meander or Greek fret which might be described as a rightlined spiral. This may be either single or double. Here the vertical and horizontal lines emphasize the plane surface of the member. The continuous spiral or wave moulding is less frequently employed on a fascia. The rosette, so frequent in Mycenæan decoration, is also used on fasciæ, especially in the Ionic style.

A very frequent form of decoration is that known as the *anthemion* or *honeysuckle ornament*. The source of this ornament is partly the Egyptian lotus-flower and bud ornament, partly the Assyrian palmetto. The more archaic Greek examples of this ornament are often very close to the Egyptian originals. This graceful ornament with its flowing lines of double curvature, which appears in endlessly varying shapes, is most appropriately employed as the decoration of the Ionic cyma; but it constantly appears also in the vertical fascia, in which case its vertical lines are more emphasized, or on the echinus when its dominant lines approximate to those of the egg and dart; or it may be used on the Lesbian cyma, particularly when this moulding is used as the cymatium of the Doric order. It is then often doubled so as to harmonize with the profile of double curvature.

Besides these ornaments various leaf forms, particularly those suggested by the Greek acanthus, are used, especially in decorations of the Ionic style, more particularly in its later phases. They occur still more notably as part of the Corinthian capital. All these decorations are used also in vase-painting, where the same principles of design are most beautifully exemplified.

Just as the Greeks in the design of their buildings were content to employ a single motive, constantly striving for its perfection, so in the decoration they were content with certain appropriate types which they had evolved, and which with variations they constantly repeated. But this continued use of certain fixed types of pattern was never allowed to degenerate to thoughtless and merely conventional reproduction. The execution was never mechanical. Thus the inscriptions relating to the execution of the Erechtheum at Athens have revealed the fact that as much was paid for little more than a foot of the exquisite egg-and-dart moulding as for one of the perfectly composed and delicate figures of the frieze. Thus for the constantly repeated decoration, as painstaking attention and as great artistic ability were demanded as for one of the human figures.

THE DORIC ORDER

An "order" in architecture is the combination of the column with the beam-system, or entablature, which it supports considered as a unit of design. In Greek architecture there are two principal orders: the Doric and Ionic. Each was developed in connection with the style from which it takes its name, but both were afterwards used together in the Attic and later in the Hellenistic styles, often even in the same building. The Doric and Ionic styles had both reached their culmination when the so-called "Corinthian" capital was invented. In Greek architecture and even in early Roman architecture this constituted little more than a variant of the Ionic order, one form of capital being substituted for the other, the entablature and the shaft and base remaining much the same.

Whatever the origin of the Greek Doric order may have been, whatever the steps by which it was wrought into its final shape, it was during the whole period in which we have positive knowledge distinctly a stone form. In its perfection it has no single member, which — properly regarded — suggests any other material, or which has not its function, its reason for being, in connection with a post-and-lintel system of stone. If its forms are not all of them primary forms, they have at any rate been so moulded and adapted to their use as to be wholly expressive, not only of the system of construction, but of the material in which they are used and for which, by whatever slow and indirect processes, they were devised. In the styles hitherto considered the forms have not always perfectly expressed the material in which they occur because so many of them are secondary forms, imperfectly adapted to their new material. In the Greek Doric architecture we find for the first time a style in which every member is in perfect accord with its place in the system and with the material used, and in which a perfect constructive and æsthetic unity is achieved. Whatever the processes by which this perfection was wrought out, the ultimate result was an organic unity such as the fine art of architecture has seldom reached.

As the type of the perfected Doric, it is almost inevitable to take for consideration the Doric order as used in Attica just after the middle of the fifth century, and especially the order of the Parthenon on the acropolis of Athens. The building itself will however be reserved for later consideration in its proper place in the order of the development.

In architecture there are, as we have already suggested, three main structural relations or functions: the downward relation or function of footing; the upward relation or function of support; and the protecting relation, the function of covering or roofing over. In the more important members, all these functions exist and are more or less completely expressed. Even in the smallest members they may be regarded as existing, at least potentially, and the completeness of this threefold expression will depend in any given case upon the importance of the member itself, and on the part it plays in relation to the rest of the structure; on its own peculiar function in relation to the whole. In the best architecture these relations will be so expressed as to give to the whole an organic character, so interrelating all the parts of the building as to make of it in a true sense a consistent organism. The unity of character essential to the perfect beauty of a work of structural fine art is attained not only by a visually harmonious relation of parts by means of balance, rhythm, and repetition, but also by such an expression of its purpose, of its structure, and of its material as shall be felt to be harmonious. It must also be harmoniously related to its position, to its surroundings, which in the case of a work of architecture are absolutely fixed. These are all æsthetic concerns. It is not a question of such form merely as the physical requirements of structure or of purpose demand. It is very far from being a question of mere engineering. It is a question of the poetic expression of the purpose, the structure, and the material in forms of beauty. The form must be felt by the trained sense to be in harmonious relation with the actual structure; that is, this structure must receive appropriate and harmonious and poetic expression in the form.

A building or a style of architecture will be more or less admirable as the requirements of these essential principles of both sensuous and organic harmony are more or less completely fulfilled, and in proportion also to the essential nobility of the purpose to be expressed. The sense of appropriate and harmonious relationship of all the parts to the whole, and of the whole to its essential purpose and environment, — this it is that produces the impression of beauty in the work of art, as in nature. Beauty is the perfect expression of nature's laws of order, of organism. And this sense of harmonious relationship will be felt by the trained mind, not only with regard to relationships merely visual or sensuous, but also with regard to those other relationships which have to do with the poetic expression of purpose, of material and structure, and of environment, which may be called organic.

These are fundamental considerations. They transcend style and are applicable in the appreciation of all styles. They apply to all forms of art, to all forms of beauty. They relate not only to the arts of design: to architecture, sculpture, painting, and the arts of handicraft. They apply also in their degree to music and to literature. They are the universal and fundamental principles of beauty, which is the appropriate and harmonious expression of truth, lovingly wrought out.

If in architecture structural expression (so often nowadays disregarded) is more important than in some of the other arts of design, it is because in architecture the structure itself necessarily plays so prominent, indeed so dominant, a part, and because the architect necessarily deals with physical forces acting on comparatively so large a scale. These physical forces, the practical requirements of the structure, the purposes more or less utilitarian of the building, these are the material out of which the architect creates his poem, his work of art. If in seeking for adequate expression he is sometimes lavish, sometimes bold, in his use of structural means, if now he emphasizes this view of the structure, now that, this is his privilege as a poet! His success will be judged by the delicacy and the completeness with which he moulds his material into an organic, a unified, and an appropriate whole.

Such delicacy and such completeness of organic unity, expressed in harmonious form, has seldom been so completely achieved, or by such simple and direct means, as in the Greek Doric, and the resultant beauty is perhaps the more striking because of the simplicity of the structural principles which are involved in the Greek Doric style.

In correspondence with the three main structural functions, an order of architecture is divided into three main parts. These are (1) the base on which the column rests, by means of which it has relation downward with the ground; (2) the column itself which is the supporting member — it may be regarded as one element of a wall resolved into its essential points of support; (3) the entablature which crowns and finishes and protects the colonnade.

Looking at a Greek temple (Figure 45) these three parts are seen to be clearly marked: first, the spreading *base* which relates the whole building to the ground and gives to the whole an expression of stability, its form being dependent on the structural principle that a wall is firmer, less liable to settle, which has broad footings to distribute its weight over a greater area; second, the *colonnade*, whose vertical elements express the idea of vertical support; and, third, the *entablature* (with its horizontal "movement"), which with the spreading roof crowns the whole. It is admirably simple and expressive.

In the Greek temple the base is known as the *crepidoma* or *stereobate*. The word *stylobate* is often loosely used as synonymous, but this latter term (that on which the column rests) is more properly confined to the upper member of the stereobate. It consists in the period of complete development usually of three, sometimes of two, successively projecting step-like blocks, or *plinths*. They are usually much higher than practicable steps, and are not essentially intended for ascent, but for a base, even when the scale is small enough to permit them to fulfil the double function. A simpler form of base, so fully expressive, could hardly be devised. The threefold function within the base itself is not definitely expressed. Such a further expression occurs in the base or podium of the Roman temple, but would be out of harmony with the simple and reserved expression of the Greek Doric.

The column is made circular in plan so as to provide for ease of circulation about it. It is robust in proportion, much heavier than mere considerations of strength would require, for what is aimed at is not merely adequate strength, but the outward expression of robust and sturdy force. The whole expression of the Doric order is one of ponderous vigor, and all its parts are moulded to this idea. The column is more distinctly subdivided than the stereobate; but the extreme reserve of expression which is characteristic of the Greek Doric appears again. It is characteristic of the race, it is distinctly Laconic, Lacedæmonian. All other orders in classic architecture show in the column itself the threefold functional division: 1, the base; 2, the shaft — the upward supporting member; and 3, the capital — the crowning member, which, as the crowning member of the column, has also the function of directly bearing the beam that rests upon it. But in the Greek Doric column only two of these members appear — the shaft and the capital. The individual base of the column is, as it were, lost in the stylobate, the upper plinth of the stereobate, which is the base of the colonnade, the common base of all the columns. This very fact tends to increase the sense of unity. The column does not appear as a detachable element complete in itself. It requires its place in the building in order to have completeness. It is an inseparable element of the colonnade. The fact of the common base of the columns in the stylobate is in some Doric buildings, as in the Parthenon, emphasized by slightly sinking the floor of the peristyle beyond the continuous stylobate plinth, thus detaching it from the rest of the floor

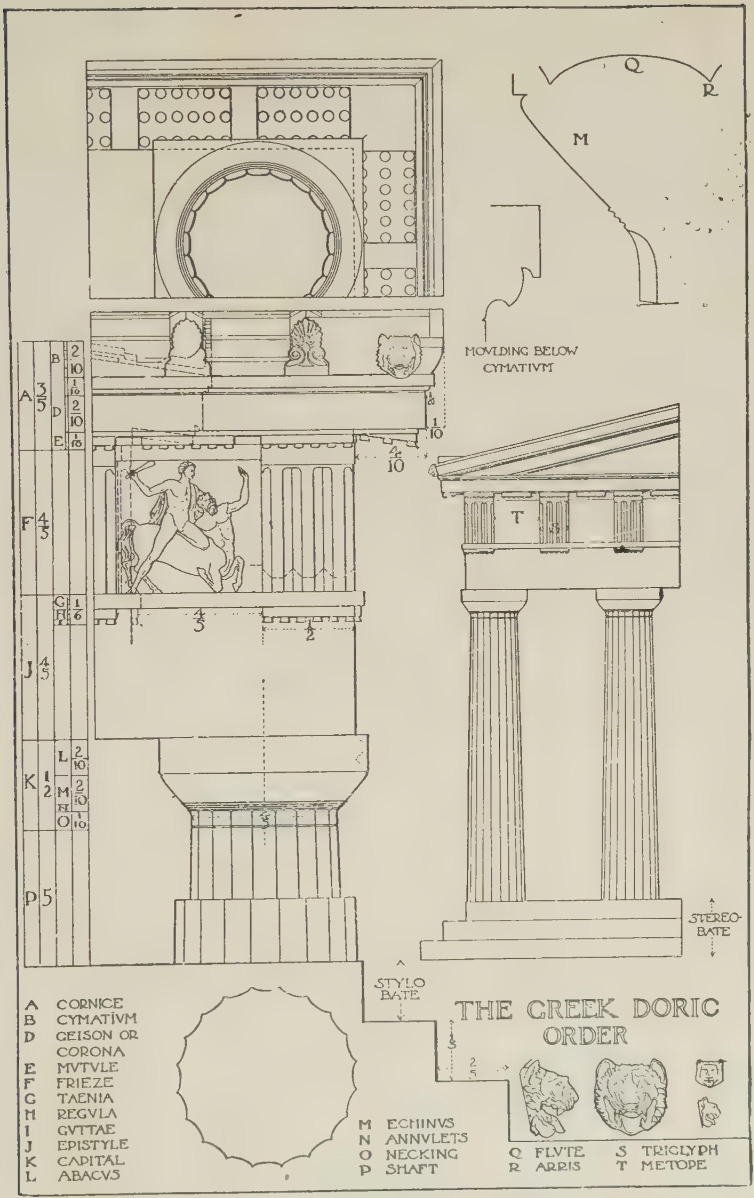


FIGURE 45. NORMAL FORMS OF THE GREEK DORIC ORDER.

From a drawing prepared under the direction of the author.

and seeming in this way to connect it more intimately with the colonnade.

The shaft is diminished in diameter as it rises upward, thus overcoming a tendency to seem top-heavy, giving an increased sense of stability, and, as it were, defining its height. In many of the best examples this diminution is so made as to give a slight, hardly perceptible curve — called *entasis* — to the outline of the shaft, which adds grace and increases the sense of vigorous upward support by adding an idea of life, of growth, enforcing in this way the sense of organic character. The curve of the entasis is such, however, that the foot of the shaft always has the maximum diameter, and the greatest variation of the entasis from a straight line of diminution drawn from the foot of the shaft to the necking of the capital is usually at about one-third the height of the shaft.

The surface of the shaft is channelled usually into twenty channels or flutes, elliptical in section and meeting in a somewhat sharp arris, the edge of which is very slightly rounded, partly to prevent too hard and rigid an effect, partly doubtless for the practical purpose of lessening the likelihood of the edge becoming chipped. These flutes, with their delicate shadows and insistently vertical lines, emphasize still further the function of the shaft as a member of vertical support. By the effect of perspective they produce a charming rhythmical subdivision of the circular shaft, and they serve also more clearly to detach the shaft from the wall behind.

The Doric capital has the full threefold division. It consists of the *necking*, which serves it as base and which connects it with the shaft; the *echinus*, the supporting member of the capital, still circular in plan and spreading outward to carry the crowning member of the capital; the square *abacus*, which is directly to carry the superimposed beam or lintel.

No more delicately and strongly beautiful architectural member has ever been devised than the Doric capital of the best period (Figure 105). It is separated from the shaft by a single incision which here emphasizes the joint so that a dark line of shadow forms the separation. The Greek designers were always careful to avoid too sharp a detachment of member from member. By most ingenious devices they continually connected one member with another, while seldom losing that distinctness and clearly marked separation which is essential to vigor of effect. So here the capital is united with the shaft by allowing the flutes of the shaft to continue into the necking of the capital, while separating capital from shaft by the clearly marked line of the incision. The foot of the echinus is marked by projecting bands or fillets, called annulets, and the flutes terminate on the lowest of these, their arrises curving over on to the lowest annulet in such a way as to produce an extremely flat elliptical curve. The insistent horizontal lines of the annulets serve to bring firmly to an end the upward movement of the flutes, while the mode of terminating the latter makes a delicate instead of a harsh transition. The annulets have the further effect of seeming to bind together the spreading echinus at its base, giving it strength and firmness, and clearly separating it from the necking. There is no weakness of articulation while at the same time a delicate transition from member to member is contrived.

The line of the echinus itself is one of the most delicately beautiful and expressive profiles ever invented even by Greek designers. It curves outward in a nearly straight but slightly swelling line at an angle somewhat steeper than forty-five degrees, until at the top it rapidly turns inward under the abacus, forming an outline of the tensest and most delicate expression of upward-supporting strength. A member at once so simple, so beautiful, and so significant hardly occurs elsewhere in the whole range of architecture. But again this wonderful line of the echinus is carefully united to the column as a whole, for the entasis of the shaft continues upward into the echinus so as to form a single magnificently strong and delicate curved line from the foot of the shaft to the top of the echinus, and yet each member preserves its identity and individuality clear and distinct. There is a further delicate relationship in the fact that the line formed by the edge of the arris of the flutes is continued by the outer edges of the projecting annulets, while the line of the back of the flutes is carried by the echinus itself.

The spreading echinus forms the most admirable transition from the circular shaft to the square abacus.

Of the abacus itself there is little to say. It is so simple: just a strong square bearing block to carry the beam that rests upon it, its square outline at the top of the column making the necessary transition to the squared lintel, the whole character in harmony with the sturdy simplicity and vigor which is of the essence of the Greek Doric. The abacus is wider than the beam that it carries, so that seen from below its lines shall slightly break through the horizontal line of the lower edge of the lintel and thus at once avoid too rigid a contrast between the vertical and horizontal, and give definiteness and distinct separation of the capital from the lintel. The capital then, like the whole order, has its threefold functional division. It has its base in the necking, its supporting member, the echinus, and its crowning and bearing member the abacus.

The beam system, the entablature (Figure 46) which the columns carry, also has this threefold functional division. First comes the beam or lintel, called the *architrave* (the main beam) or in Greek architecture the *epistyle* (the thing resting upon the column). The epistyle rests squarely upon the abacus, so that its centre is over the centre of the column. The outer edge is always set well back from the outer edge of the abacus, and in examples of the best period the outer face of the epistyle comes over the line of the shaft at about one third the height of the shaft from the ground. This

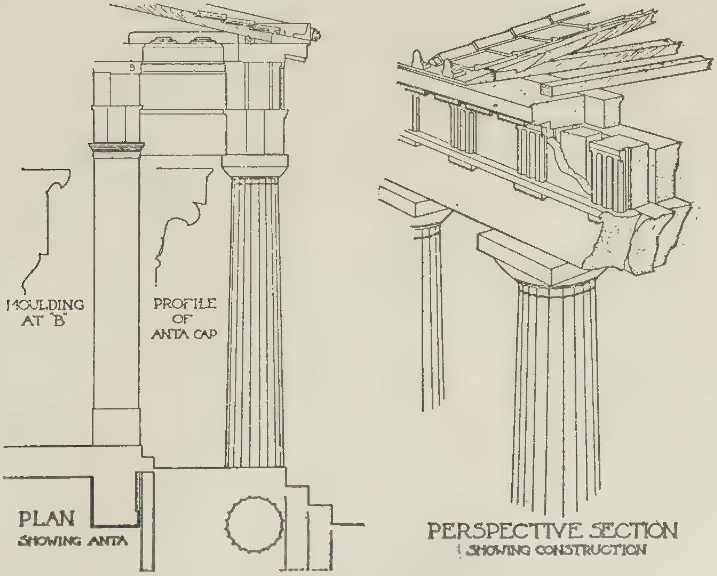


FIGURE 46. CONSTRUCTION OF THE GREEK DORIC ENTABLATURE.

From a drawing prepared under the direction of the author.

arrangement was found by long experiment to give a much better sense of poise to the entablature in its relation to the column. The epistyle usually consists of two or three blocks set side by side, according to the scale of the building and the nature of the material used. The epistyle has its own distinct crowning feature, a simple projecting band or *tænia*, under which at intervals are short bands called *regulæ* from which depend decorative drops, *guttæ*. The epistyle has its footing in the abacus of the column, just as the column has its footing in the stylobate.

Upon the epistyle rests the *frieze*. This member is essentially a piece of wall. It is not a structurally necessary member of an order. It may be, and it often is, omitted, when the scale or proportion of the structure demands. It is usual, because in most cases it is necessary to give adequate height to the entablature without too great coarsening of its parts. As a piece of wall its function is to enclose and to support. Like the wall it may be either continuous, as it is in the Ionic order, or it may appear to be resolved into points of support. This latter motive is almost invariably adopted in the Doric order. The Doric frieze is essentially an echo of the colonnade. At first thought the Doric frieze may seem to contradict the essential character of the order: its reserve, its Laconic character. The frieze may seem to be saying more elaborately and with more flourish what the Ionic order more simply expresses. Further consideration however will make clear that this very insistence on an apparent structural character enforces precisely that vigor and robustness of expression which belongs to the Doric. Moreover the Ionic frieze is almost always decorated with continuous figure sculpture, and thus becomes both more delicate and more elaborate in character. The strong rhythm and beat of the repeated triglyphs, recalling the vigorous rhythm of the colonnade below, only serves to emphasize the idea of virile strength, to increase the sense of sturdy and simple force.

The Doric frieze, then, is conceived as a stubby colonnade of square piers resting on the epistyle as a base, and in the Parthenon it is so constructed. These piers or blocks are called *triglyphs* from the three channels (two and two halves) which mark their face. The spaces between the triglyphs are called *metopes* and are customarily filled with carved or otherwise decorated blocks or slabs. Regarded as a colonnade it is a matter of course that one of these triglyph blocks is placed at the angle of the building. It would be hardly less absurd to place the columns away from the angle of the building and leave on the angle a space, than to place the triglyphs away from the angle and leave there two abutting half metopes; an absurdity never committed even by the Romans, though suggested by Vitruvius. Regarded as short square piers, *i.e.* as members of vertical support, it is appropriate that the triglyphs should be marked by vertical channels. Since however the triglyph remains square in section (from its position it could hardly be otherwise) it is appropriate that these channels should consist of straight-sided sinkages. They are V-cuts, harmonizing with the rectangular section of the triglyph, just as the curved section of the column flutes harmonizes with the circular plan of the shafts. They are finished at the top by elliptical termination not unlike those of the column flutes. The triglyph frieze is only to be understood as an echo of the colonnade below.

Like the epistyle the frieze has its crowning feature, a simple tænia, which however is not quite continuous, but is usually narrower over the metopes than over the triglyphs.

The metopes, essentially open spaces, are in the Parthenon filled in with sculptured slabs let into grooves in the sides of the triglyphs. Usually however the frieze is only decoratively regarded, and triglyphs and metopes are most frequently cut in the same solid block. In other words the construction is that of the wall, although the decorative treatment of the colonnade has been adopted. As has already been stated, underneath the tænia of the epistyle are the regulæ. These serve to mark the position of the triglyphs and by carrying down the line of the triglyphs into the frieze serve to bind the two together, just as the shaft is united to the capital by continuing the flutes into the necking. When, as was invariably the case, the building was colored, the same color was used on both regulæ and triglyphs in order still farther to emphasize the connection, while the tænia of the epistyle was given a contrasting tone, and the metopes were contrasted in color with the triglyphs. A similar connection as will presently be noted was made between the frieze and the cornice. The purpose of the guttæ, depending from the regulæ, is purely decorative. They soften the termination of the movement of the triglyphs downward, preventing too harsh an ending. They were usually gilt, their sparkle giving relief to the stern sobriety of the design.

Upon the frieze is placed the projecting *cornice*, the crowning and protecting member.

The cornice of an entablature or of a wall is essentially an overhanging block or coping, the purpose of the cornice being not only to give a sense of finish and termination to the wall, or to the order, but to protect it from the weather.

The cornice-block or *corona* — the *geison*, as the Greeks called it — is therefore in the classic styles the essential member of every cornice as such. If the corona has great projection it may be supported by a series of gradually projecting mouldings known as *bed-mouldings*. At the top a gutter to catch the roof water, with spouts at intervals, may be added by way of upward termination. Such a gutter in the classic styles is called, from its usually wave-like shape, a *sima* or *cymatium*.

It will be seen that the completely expressed cornice consists again of three main members; the bed-mouldings which form its footing, the corona which is its main member, and the cymatium which is its crowning feature. In the Ionic order all these three members are clearly and elaborately expressed. In the more reticent Doric all the emphasis is placed on the geison. The bed-mould hardly exists. It is a slight moulding cut on the cornice-block itself to form a transition from the wall or from the frieze, as the case may be. The cymatium is always used on the raking gable-cornice to protect the entrance. It sometimes appears on the horizontal cornice of the sides of the building, but it is usually wanting here, the roof water being allowed to run everywhere over the cornice edge to the ground. In this case by way of terminal features of the cornice a series of ornaments called *antefixes* are usually placed over each triglyph and each metope of the frieze below. The antefix was originally the closing feature of the otherwise open ends of the terra cotta roof tiles, but it finally was used, as in the Parthenon, purely as a decorative terminal feature.

If a coping stone is left as a squared block merely, the raindrops (especially if such a stone be used as a cornice below a sloping roof) would follow the horizontal underside (or soffit) and run down on the wall. In order that the rain may fall clear of the wall, the soffit of the corona must be undercut, sloped away, so that the water would have to run uphill. This has the further advantage of reducing the weight of the overhanging portion of the corona and thus increasing its stability. This is done in the Doric cornice; but in addition the soffit of the geison is channelled out, still further lightening it, the channels leaving a series of blocks depending from the soffit. These blocks are called *mutules*. They have precisely the width of the triglyphs in the frieze below and are placed one over each metope and one over each triglyph. They thus unite the frieze with the cornice, precisely as the frieze is united with the epistyle by means of the regulæ. Like the regulæ the soffits of the mutules are decorated with guttæ. As in the case of the regula, also, the mutule is painted the same color as the triglyph, generally blue, thus still farther emphasizing the connection. It is another instance, of which several have already been noted in the Doric order, of the care exercised by the Greek designers to unite one member with another. The mutules therefore are of structural value, in so far as the channels between them serve to lighten the overhang of the geison, but their main purpose is doubtless æsthetic, that — with the regulæ — of binding epistyle, frieze, and cornice more intimately into one whole. The soffits of the mutules like the soffits of the regulæ are decorated with guttæ, three rows of them, six in each row.

The front face or fascia of the Doric corona is further subdivided. Close to its lower edge, which is set back, runs a drip-moulding. This throws off the raindrops and still further obviates any tendency of the water to flow along the soffit of the corona. It has also the great æsthetic advantage of marking by a line of sharp shadow the lower edge of the brightly lighted geison. The fascia of the geison is crowned by a beak-moulding, the moulding called, because of its frequent use in the Doric style, the Doric cyma.

The threefold function of footing, supporting, crowning, or the simpler twofold function of supporting and crowning which is chiefly accented in the design of the Doric order (the function of footing being constantly merged in that of the crowning feature of the member immediately below), is further emphasized by the proportions of the Doric order, the main proportion of colonnade to entablature being constantly repeated or suggested, in the analogous proportions of parts which have analogous functional relation: as in the proportion of shaft to capital, — architrave and frieze to cornice, — height of epistyle to its tænia, — height of frieze to its tænia, — height of corona-fascia to its crowning cyma. There are throughout the design, as in fine designs of every style, numerous other repeated proportions, sometimes precisely repeated at larger or smaller scale, tending to give coherence, like the repetitions of rhythm in verse, or the repeated phrases or motives in music, taken up now by one instrument of an orchestra, now by another, constantly varied while retaining their essential forms, and thus giving unity of character to the whole movement.

Such then is the form of the Doric order. It remains to be considered how this order is used in the formation of the colonnade and the treatment that is given as a whole to the rest of the design, whether temple, or other building, in which the colonnade is used.

The distance of the columns apart on centres or the spacing of the columns is called the *intercolumniation*. The space between each pair of columns is called an *intercolumn*. The intercolumniation of the Doric order is absolutely dependent upon the spacing of the triglyphs in the frieze. The angle column is necessarily placed directly at the corner. Since the triglyph above is necessarily also placed at the corner, this brings the inner edge of the corner triglyph very nearly over the line of the centre of the corner column: but all the other columns are so placed that the centre of each column is vertically on a line with the centre of a triglyph, usually of each alternate triglyph. This brings the intercolumns next to the corner less than all the others by about half the width of a triglyph. This has the advantage of strengthening the corner and seeming to close the rhythm of the colonnade. Still further to emphasize this strengthening of the angle the Greeks usually made the angle column of slightly greater diameter than all the others.

The horizontal cornice of a colonnade below a pediment is necessarily without a cymatium, or gutter, since such a feature would be meaningless, even when a cymatium is used on the sides. For a similar reason there are never antifixæ on the cornice below the pediment. The pediment itself is here the sufficient crowning feature. The raking cornices of the pediment are similar to the horizontal cornices, but are without mutules. Their soffit however is strongly undercut. They are always surmounted by the cymatium, since this is here necessary to protect the entrances from the rain-water and to guide it down to the sides of the building. The face of the tympanum of the pediment is usually set back somewhat from the line of the face of the frieze below it, in order to afford more space for the sculpture usually placed here. The roof tiles consist of broad flat tiles (the *tegulæ*), (which lap over each other in the direction of the slope, the adjoining sloping edges being slightly turned up) and narrower tiles, whose under face is hollowed out (*imbreces*), which cover the sloping joints of the tegulæ, their ends fitting into each other like drain-tiles. The tiles in earlier buildings were of terra cotta, in later ones often of marble. The cymatia were generally of the same material as the roof tiles. The open end of the lower imbrex of each row when the tiles were of terra cotta was closed by a terra cotta boss or vertical ornament of circular or curved triangular form, the antefix, already referred to, which in buildings having marble tiles was used merely as an ornamental upward finish for the cornice.

It will be seen from this analysis of the Doric order that there is here nothing capricious, nothing meaningless, that in the whole order, in the whole building, there is no member, no smallest detail that has not its significance in relation to the whole, that every part is harmoniously related to every other, is carefully adjusted to its particular place in the building and is necessary to the total effect, to the unity and meaning of the completed design, each least member contributing its share to the creation of an organic unity in which the structure receives most beautiful and marvellously appropriate expression, in forms which are essentially those of an architecture of stone.

ORIGIN OF THE DORIC STYLE

The steps by which the Doric style was developed during the dark period of history from the overthrow of Mycenæan civilization to the seventh century are lost in the obscurity of the times and are still largely matters of conjecture. Some

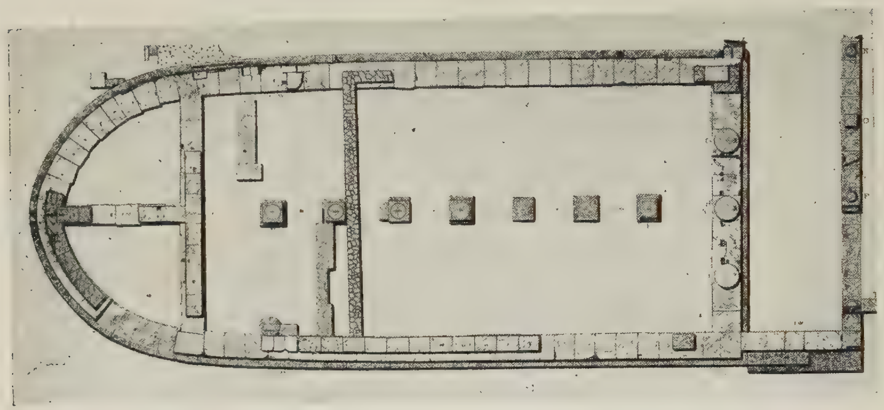


FIGURE 47. SOUTH WING OF THE BOULEUTERION AT OLYMPIA.
From E. Curtius and F. Adler's "Olympia," Tafelband 1 (1892), Pl. 55.

primitive foundations, probably of early Dorian epoch, lend color to the idea that the primitive Doric hut was similar to the primitive Achæan house (Figure 38). An early form seems to be followed in the south wing of the Bouleuterion at Olympia, the sides of which are sensibly curved, the apsidal termination slightly ovoid in shape (Figure 47). The oldest rectangular structure subsequent to the Dorian invasion is probably to be seen in the remains of the temple of Artemis Orthia at Sparta, which at latest belongs to the middle of the eighth century. Like the Bouleuterion at Olympia it has a row of columns down the centre. These buildings show the continuance of primitive, pre-Mycenæan types of plan in the early Doric period.

Apart from such scanty remains as these, a single monument, imperfectly preserved and much altered in later times, marks the period of transition to the Doric style. This is the Heræum, or temple of the goddess Hera, at Olympia in Peloponnesus.

Olympia, the site of this temple, was not a city. It was a sacred place, the home of the Olympian Zeus, the seat of the great national games which more than any other event or observance tended to give a sense of solidarity to the rival and often mutually hostile Greek peoples. All Greek races took part in this sacred festival, which occurred every fourth year. From the sixth century onward the games were celebrated under the direction of the town of Elis, with the special protection of Sparta. All warfare between the Greek states was suspended during the games, and all roads leading to Olympia were regarded as sacred and under the protection of the god. Here the great stadium, — the arena, or running track, — within which the athletic contests were held, was built; and within the sacred enclosure, or Altis (the "grove"), in the course of time, numerous temples and shrines, treasuries of many of the Greek states, altars, votive offerings, statues, in bronze and marble, of the gods and of the victorious athletes were set up (Figures 48 and 85). No Greek site had greater national importance, not even Delphi, the seat of the oracle. No other games — neither those of Corinth nor of Athens — attracted so many from all Greek lands. No sacred place, save perhaps the acropolis of Athens, can have had a richer or more impressive beauty. In later times, Roman emperors took part in the games and great Roman buildings were added. When however the Roman Empire became Christian and the East had parted from the West, the Emperor Theodosius I in A.D. 393 decreed that the games, as a pagan institution, must cease. As, however, they were revived, his successor Theodosius II in A.D. 426 had the temples destroyed by fire, and the sacred site was deserted. Gradually, when earthquake had completed their overthrow, the débris brought down from the hills by the torrent Kladeus, which here flows into the river Alpheus, covered the ruins. First a Greek, then a Frank, then a Slavic village sprang up on the site. These in turn were ruined and ultimately covered up until Olympia in its valley had utterly disappeared from sight.

The French scholar Montfaucon in 1723 first suggested the hope of its rediscovery. In 1768 the great German archæologist Winckelmann reiterated more definitely his belief in the possibility and the probable importance of investigations. In 1805 W. M. Leake and, in the next year, Edward Dodwell identified the nearly buried ruins of the Temple of Zeus. During the Greek wars of liberation in 1829, when the Morea was occupied by French troops, and a French scientific expedition characteristically followed the French army, the French architect Blouet made excavations, but his time here was necessarily limited. He uncovered however one corner of the great Temple of Zeus and some of the sculptures, some of which were taken to the Louvre. The final rediscovery of Olympia was the result of that remarkable series of campaigns under the direction of the historian Ernst Curtius, which during the years 1875 to 1881, with characteristic German thoroughness, uncovered substantially the whole site, bringing to light, besides the enclosing walls and gateways, no less than three temples, some thirty-five other buildings, one hundred thirty statues (including such noteworthy examples as the Hermes of Praxiteles and the Victory of Pæonius), four hundred complete inscriptions, thirteen thousand objects of bronze, six thousand coins, and countless lesser objects. No such series of finds had ever before been made on a classic site, and the excavations set the standard for future explorations. Such briefly is the romance of Olympia.

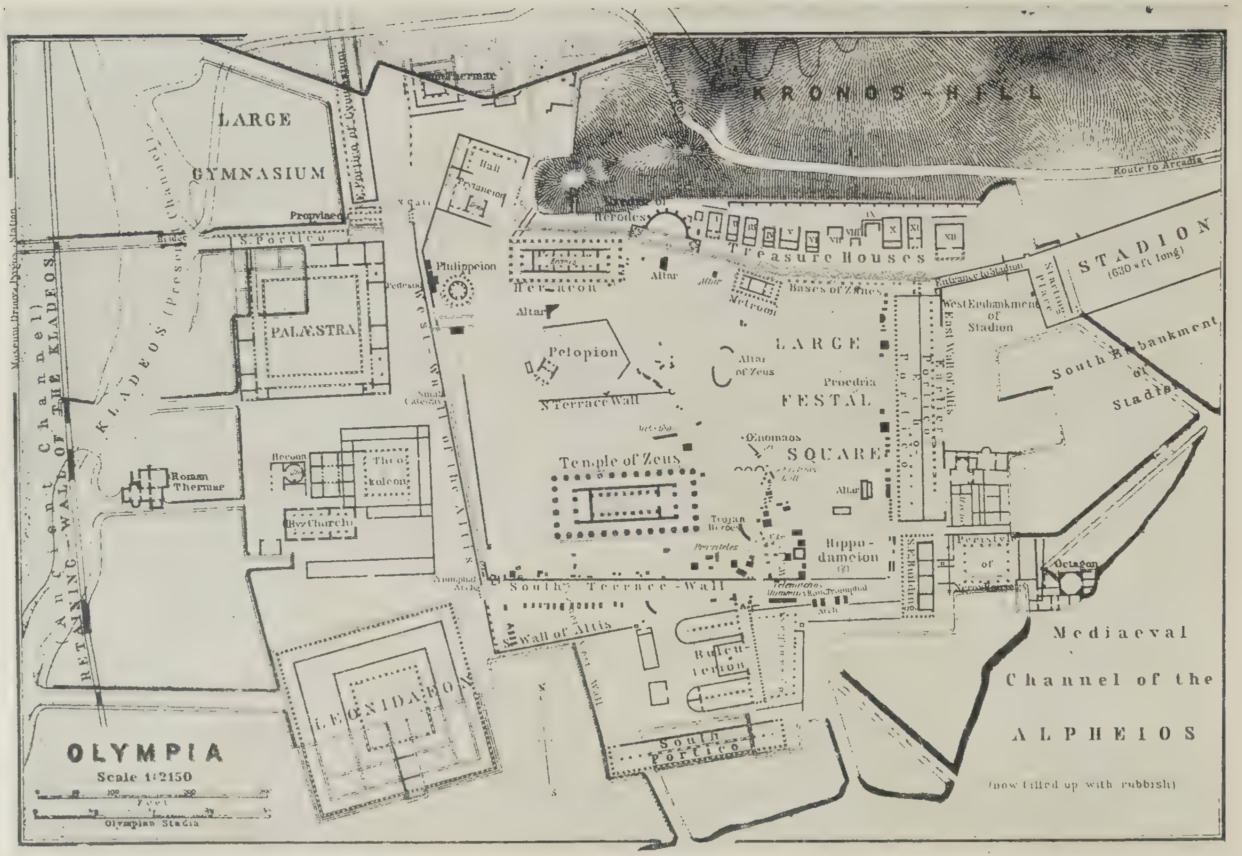


FIGURE 48. PLAN OF THE BUILDINGS AT OLYMPIA.
From the drawing by William Dörpfeld in Baedeker's "Greece" (1905).

The Temple of Hera, though not the largest, is, owing to its antiquity and peculiar character, perhaps the most important of the buildings discovered. It was in the investigation of its ruins that the archæologist Dörpfeld first distinguished himself. The temple is probably older than the first Olympiad and may perhaps in its oldest form date from about the tenth or eleventh century B.C. Certainly it must go back as far as the ninth.

In type it already shows the form and arrangement of the characteristic Greek temple. In plan (Figure 48) its proportions alone indicate its antiquity. It has a long narrow cella measuring about ninety-one feet by twenty-seven feet, which had an interior colonnade of eight columns on each side. These interior columns seem, however, to have been later additions. Originally there was a series of wing-walls in the line of every alternate column, dividing the interior into a series of recesses or side chapels. The cella was preceded by a pronaos distyle in antis. A similar portico at the rear, the epinaos or opisthodomus (rear chamber), had the same arrangement of columns; but the rear porch has no connection with the interior. This cella with its two porches, one at each end, is surrounded by a colonnade of six columns in the front and rear, and sixteen columns on each side, counting the angle columns twice. The cella walls and the side walls of the porticoes remain standing to a height of about three feet. This height consists of three courses of block stone within and a single course of upright slabs on the outside of the wall. This low wall of stone is quite even on top. In other words it shows no evidence of ever having been any higher. The structure was found buried in a clayey earth quite different in character from the surrounding soil which had filled in the site. It seems therefore practically certain that above the stone wall now standing, which formed the base, the construction was of sun-dried brick. In other words it was the traditional Mycenæan mode of construction. Confirmation of this is found in the shape of the ends of the anta-walls of the porches (Figure 49). These are slightly recessed in the inside, and dowel holes in the stone pavement seem to show quite conclusively that the antae, which have disappeared, were formed each of two planks, one set against the end of the wall, the other against the inside so as to take the end of the beam of the portico. Such planks would be needed in sun-dried brick construction to protect the end of the brick wall from the weather. All this is precisely the

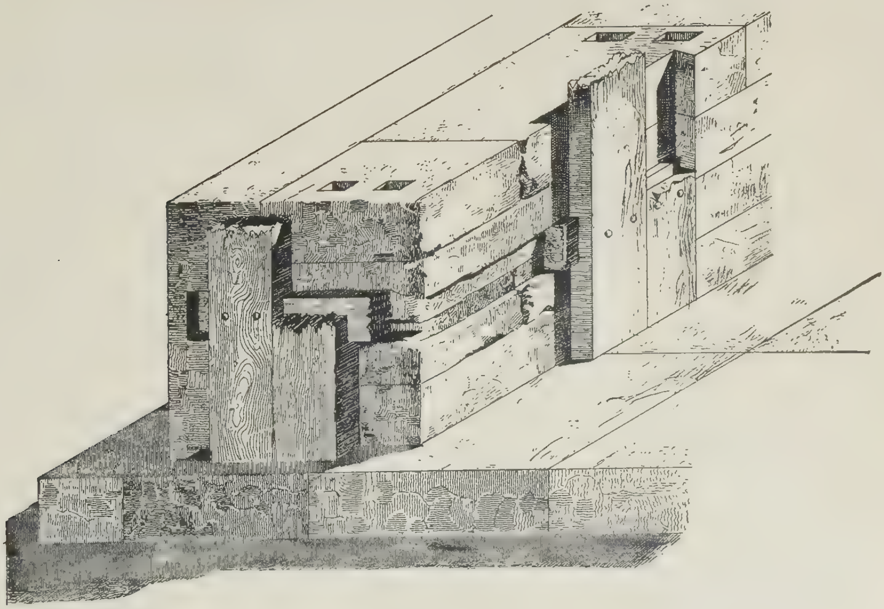


FIGURE 49. NORTHWEST ANTA OF THE HERÆUM, WITH WOOD FACING.
From E. Curtius and F. Adler's "Olympia," Tafelband 1 (1892), Pl. 23.

Mycenæan method, such as is indicated by the ruins at Tiryns. It explains the peculiar form of the plan of the anta of the later temples. The form of the base of the cella wall, with its upright slabs, explains the form, traditionally preserved, of the later wall base in Greek temples, a form not very well adapted as the base of a wall of block stone, but perfectly suited to support a wall of sun-dried brick. It is clear from the position of foundation walls that there was always an encircling colonnade, but the columns of the present peristyle are Doric, and Doric of every period of the style, showing capitals of every important Doric type from the earliest known widespreading capitals with bulging echinus to capitals of slight projection and with the stiff straight-sided echinus which belongs to the time of King Philip of Macedon and Alexander the Great (Figure 50). The shafts also vary in diameter from three and one fourth to four and one half feet; they vary in amount and character of diminution; some are straight-sided, some have the entasis or slight curvature of the shaft outline; and one has sixteen flutes or channels and the others twenty. Pausanias, the Greek traveller of the second century of our era, whose detailed account of his journeys in Greece (practically a guide book of that time) is so full of invaluable information both as to existing and destroyed monuments, — Pausanias tells us that one of the two columns in the opisthodomus (or epinaos) of the Heræum was of oak. Dörpfeld has conjectured, and the conjecture amounts to a certainty, that all the columns were originally of wood. Dörpfeld believes that these facts give us proof of the origin of the Doric column in the imitation of the wooden Mycenæan column. But the Mycenæan column has a shaft tapering downward and is smallest at its base, while the fluted Greek

Doric column tapers upward and is smallest just below the capital. Pausanias does not tell us anything of the form of the oaken column. The Mycenæan character of the construction of the cella makes it likely that the columns also were of the Mycenæan form, as represented over the Lions' Gate and as found in the flanking columns of the Tomb of

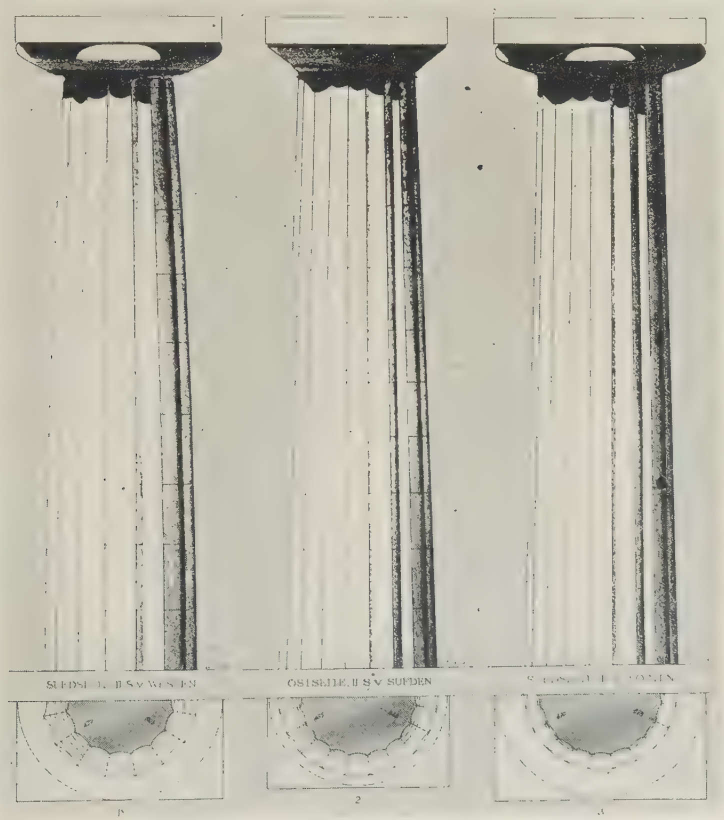


FIGURE 50. COLUMNS OF THE HERÆUM

From E. Curtius and F. Adler's "Olympia," Tafelband 1 (1892); Pl. 21.

Agamemnon and elsewhere. This is a column whose shaft is of utterly different character from that of the Greek Doric column. The Doric capital, on the other hand, shows a clear analogy with the Mycenæan and Cretan capitals and may very probably have been derived from it. Of the columns in the interior of the Heræum nothing has been found. The disk-like bases alone remain. The diameter is very much less than that of the lower diameter of any of the outer columns. These interior columns, unlike those of the later temples, are placed directly on a line with those of the outer colonnade, a fact which increases the probability that the whole roof construction and beam-system resting upon the columns was of wood. It seems to imply a series of great beams running across the building and supported by the outer colonnades, the cella walls, and the inner colonnades. That the roof was a sloping gable roof of low pitch is made certain by the discovery of considerable fragments of the huge disk-like gable finial, or acroterium, of terra cotta, the shape of which is such as to give precisely the pitch of the gable. The disk measures over seven feet in diameter and is enamelled in brown, white, and black on the red terra cotta. To have been able to bake so large a piece of earthenware shows great advancement of technical skill. In spite of the low pitch, the roof would seem not to have been formed by building up to the slope with clay laid on the horizontal ceiling. Pausanias reports the story of his guide that in the space "between the ceiling and the roof" had been found the armed skeleton of a hoplite, who when wounded was said to have found refuge there at the time of the fight between the Elians and Spartans which in 400 B.C. desecrated the Altis, a story which is of interest as proving that there was a roof space, implying not only that there was a flat ceiling, but that the roof must have been supported by sloping wooden roof beams.

In view of the scarcity of the earliest remains the question of the origin of the forms of the Doric column and entablature is largely one of theory. A brief statement of the theories and some of the objections to be urged against them seems at this point desirable. The oldest is that of the Roman architect Vitruvius, writing his "Ten Books of Architecture" probably in the time of the Emperor Augustus, and professedly drawing on earlier Greek sources which have long since vanished. After describing the timbering of a wooden roof and entablature, he goes on as follows: "In accordance with these details and starting with carpenters' work, artisans in building temples of stone and marble imitated those arrangements in their cut stone, believing that they must follow those inventions. So it was that some ancient carpenters, engaged in building somewhere or other, after laying the cross-beams so that they projected from the inside to the outside of the walls, closed up the space between the beams, and above them ornamented the cornices and gables with carpentry work of beauty greater than usual; then they cut off the projecting ends of the beams, bringing them into line and flush with the face of the walls; next, as this had an ugly look to them, they fastened boards, shaped as triglyphs are now made, on the ends of the beams, where they had been cut off in front, and painted them with blue wax so that the cutting off of the ends of the beams, being concealed, would not offend the eye. Hence it was in imitation of the arrangement of the tie-beams that men began to employ, in Doric buildings, the device of triglyphs and the metopes between the beams. Later, others in other buildings allowed the projecting rafters to run out till they were over the triglyphs, and then formed their projections into mouldings. From that practice, like the triglyphs from the arrangement of the cross-beams, the system of mutules under the coronæ was devised from the projection of the rafters. Hence, generally in buildings of stone and marble, the mutules are carved with a downward slant in imitation of the rafters. For these necessarily have a slanting and projecting position to let the water drip down. The scheme of triglyphs and mutules in Doric buildings was, therefore, the imitative device that I have described." [1] Carrying this more or less general statement of Vitruvius somewhat farther, archæologists have invented a carpentry entablature which, beyond even his, seems much more the imitation of a structure of stone in wood than vice versa. All of its parts exactly correspond to the Greek Doric order, however little these may seem really to suggest wood. The theorists have then seen in this creature of their imagination, for which there is no direct evidence and which would be very bad carpentry, the precise origin of the Doric forms in every detail. On this scheme the regulæ are the projecting ends of unnecessary planks, or are equally unnecessary strips of wood, the guttæ become wooden pegs, and the whole design of the Doric order becomes a wooden construction merely "reproduced" or copied in stone. Yet the whole aspect of the Doric colonnade, in its firm lines, in its robust proportions, makes essentially the impression of a structure of stone.

Vitruvius says nothing direct as to the column. His perfect familiarity with the mixed system of construction in which the columns were of stone and the entablature wholly of wood — as in Etruscan temples and his own basilica at Fano — and his lack of knowledge of such a thing as a wooden column, doubtless explains his reserve. Modern archæologists, however, have not hesitated to see in the Doric column a reproduction of a column of wood, regardless of the fact that a form and proportion more inappropriate to a wooden pillar it would be hard to devise.

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[1] Vitruvius, Book IV, ch. 2. Morgan's translation (1914).

This is the theory of the wooden origin of the Doric order in its crudest form (Figure 51).

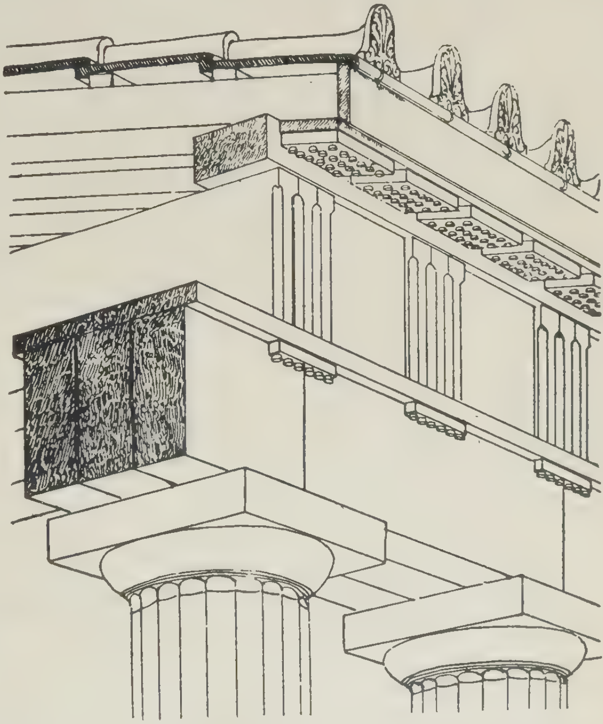

FIGURE 51. RUDIMENTARY SUGGESTION OF A TIMBER ORIGIN OF THE DORIC ORDER.

From W. J. Anderson and R. P. Spiers' "Architecture of Greece and Rome" (1907), Fig. 43.

In considering the value of the authority of Vitruvius, of which so much has been made, it is well to remind oneself of the highly fanciful character of many of his theories and conjectures. It is very clear that in his own day he was a person of but mediocre reputation, and that he owes the extraordinary influence he has had on modern architecture theory solely to the fact that his is the only ancient treatise on architecture that has come down to us. Its value on this account is great; but in referring to it the nature of the authority one is consulting ought to be borne in mind.

The degree of authority to be given to Vitruvius' account of the Doric may be gauged by his account of the origin of the Ionic. Having, according to his statement, established the proportions of the Doric column as six times its height (a proportion it did not reach until the time of decadence), from having noted that "in a man, the foot is as one-sixth of the height," "so afterwards . . . they translated these footprints into terms characteristic of the slenderness of women. . . . They substituted a base in place of a shoe; in the capital they placed the volutes, hanging down at the right and left like curly ringlets, and ornamented its front by cymatia and festoons of fruit arranged in place of hair, while they brought the flutes down the whole shaft, falling like the folds in the robes worn by matrons"!

A more modern theory as to the beginnings of the Doric, since the discovery of the Egyptian so-called proto-Doric columns of the rock-cut tombs of Beni-Hassan and elsewhere, sees in these the direct origin of the Doric column. It is to be noted, as against the idea that the Beni-Hassan column is to be regarded as in any strict sense proto-Doric, that its proportions and general aspect, particularly as seen in rude colonnades as those of Deir-el-Baharee, recall that of the latest rather than the earliest examples of the Doric order, that it is comparatively slender with but slight diminution and that on the other hand the earliest Doric shafts are very heavy and their diminution very strongly marked.

This theory as a whole is now generally discredited; but it seems nevertheless not impossible that the sight of such columns may have had its influence on the early Doric designers.

The French architect Viollet-le-Duc,[1] especially, has championed the idea of the stone origin of the order and has pointed out what he conceives to be the significance and purpose of the different parts, and generally speaking with justice. Bötticher, also,[2] sees in the triglyphs upward-supporting piers (*aufwärts-strebende Pfeiler*).

One of the late theories, put forward since the discovery of the Heræum at Olympia, is that of Dörpfeld. According to this view the original Doric construction was the mixed construction of stone, sun-dried brick, and wood. Dörpfeld still sees in the Doric column a reproduction of a wooden column, and regards this as proved by the evidence which undoubtedly shows, as we have seen, that all the columns of the Heræum were originally of wood. Mr. W. J. Anderson goes so far as to say[3] that it proves that the Doric column in its earliest stages was of wood, with the diameter of the shaft (the original wooden shaft of the Heræum) diminished toward the top.[4] Everything, on the contrary, tends to show the opposite. In all periods of vital growth in architecture, *i.e.* in all periods down to modern times, it has been the custom of builders in repairing or adding to old buildings to disregard the style of the old, and make the changes in the style current at the moment. We thus, in much later times, have not only Romanesque buildings with later Gothic features added, and buildings of Early Gothic work with late Gothic changes or additions, but we find similarly Gothic buildings with additions in Renaissance or neo-classic style. That the mode of procedure was similar in the case of the Heræum is shown by the existing stone columns which are of every period of the Doric style. Their existence therefore by no means indicates that the previously existing wooden columns were Doric, or that they resembled Doric. Pausanias says nothing of the form of the old column of oak in the opisthodomus of the Heræum. On the other hand, the character of the construction would seem to make it likely that the original wooden columns were of the Mycenæan type, and the evidence goes to show that the building continued to exist intact in its original condition until a time when the Doric style was already developed and had come into full vogue. The Heræum helps us little, therefore, in determining the beginning of the Doric column. More recently, and particularly since the discoveries at Knossos, it has been suggested that the Doric column is the Mycenæan column with its shaft turned upside down. This is in itself a most improbable suggestion, and the difference in proportion and aspect between the Mycenæan column and the earliest Doric is about as striking as that between any two columns well could be.

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[1] *Entretiens sur l'architecture*, vol. 1 (1863), pp. 50–51.

[2] *Tectonik der Hellenen*, vol. 1 (1852), pp. 158–166.

[3] Anderson and Spiers: *Architecture of Greece and Rome* (1907), p. 21.

[4] *Per contra*, Koldewey and Puchstein: *Die Griechischen Tempel in Unteritalien und Sicilien* (1899), p. 220. "Sich eine altdorische Säule als ein primitives u. doch plausibles Holzegebilde vorzustellen ist absurd." Koldewey's whole treatment of this subject (pp. 219–222) is the best known to me.

Assuming, what indeed seems self-evident, that the Doric column is essentially a stone form, and adopting Dörpfeld's theory with regard to the entablature, Dr. Josef Durm presents an ingenious conjectural scheme of primitive Doric construction which certainly has much to commend it. It will be clear from the engraving here reproduced (Figure 52).

Against this, as against other similar theories as to the origin of the entablature, these objections at least are to be noted. In the first place, in the triglyph-frieze the triglyphs always appear both on front and sides, and the triglyph at the angle has distinctly the aspect of a small vertical pier. In the second place, the ceiling of the pteroma is not behind the frieze, where one would expect it if the triglyphs "represented the ends of beams," the position which it does occupy in Ionic construction, but in Doric construction it is invariably behind, or nearly behind, the cornice. It is difficult to understand, on the theory that the triglyphs are but thoughtless reproductions of beam-ends, — features that have therefore lost their meaning, — how the ceiling came to be raised

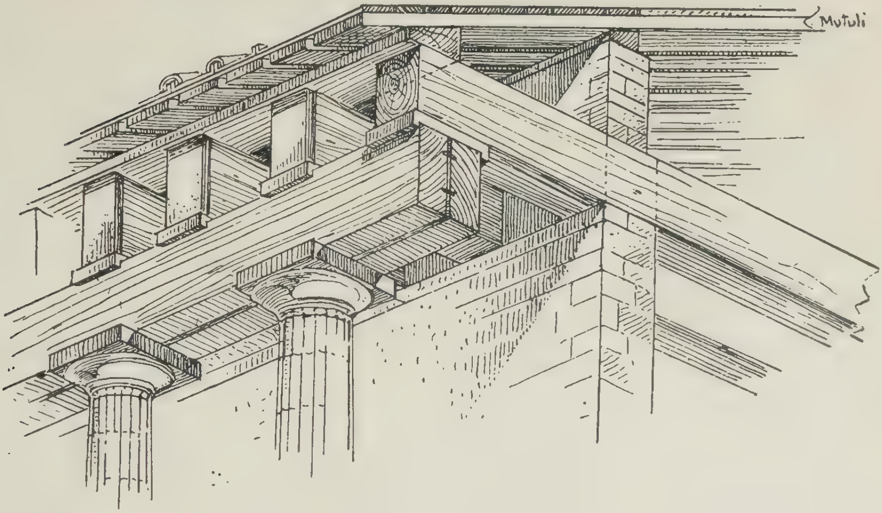

FIGURE 52. A SUGGESTED TIMBER ORIGIN OF THE DORIC ENTABLATURE.
From J. Durm's "Baukunst der Griechen" (1910), Fig. 233.

to its present position. There would be no reason impelling toward such a change from an established tradition, a tradition whose results in the Ionic order were found perfectly satisfactory. We may therefore question the likelihood of such a tradition in connection with the Doric order. Objection may also be raised to some other details of Durm's primitive Doric construction. Neither the regulæ nor the peculiar form of the corona are reasonable features of a wooden construction. Their existence as part of a supposed primitive wooden mode of building seems forced and unnatural, and there is no evidence that there ever were such wooden features. Several early Doric temples of stone had no regulæ (Temple on Ortygia at Syracuse, Well-shrine at Cadacchio, "Basilica" and "Temple of Ceres" at Pæstum, Temple at Assos).

The trouble with all such theories is that they assume what they are endeavoring to prove, and then try to force the evidence. They do not take the existing evidence and see what conclusions it would naturally lead to. They fail also by looking for a single and perfectly simple prototype for an organism which is likely to have been produced by degrees and by the use of elements derived from several, perhaps many, sources. The architect has only to examine the processes of his own mind, as he designs, to make clear to himself that his solution of a novel architectural problem in a given case is often not suggested to him by a single prototype, but that it is apt to come to him from several and perhaps diverse sources, which together suggest, but do not directly dictate, the solution at which he arrives, and which in the main grows out of conditions inherent in the problem itself, and not from circumstances belonging to some other technic.

The Doric column in its earliest period is so distinctly and characteristically a stone form, is so absolutely expressive of that material, that it is difficult to imagine that it can have had its direct origin in any other. Moreover, it is to be noted that in the history of the Doric order we find it starting with extremely heavy and squat proportions and that in spite of fluctuations it tends on the whole to become more and more slender. The post of wood — in origin inevitably a tree-trunk — is characteristically slender in proportion, and in adjusting such a form to stone the tendency, as in the case of the Ionic order, would be to begin with a decidedly slender shaft and, in using it in stone, to make it gradually less slim. The Doric development was the reverse of this.

The extremely diminished shafts, frequently with very bulging entasis, that belong to the earliest columns suggest that when stone was first used the supports may have been built up of small materials. As it was the custom to cover the buildings with stucco and to color them, this seems the more probable. That the early Greeks had contact with Egypt is abundantly indicated both by their art and by their legends, and it is not impossible that the methods in use in Egypt at this time, the building of columns out of small stones to be covered with stucco, may have been imitated by these active-minded people who were in the habit of taking their own wherever they found it. So too the fluting of the shafts may have been suggested by columns of the Beni-Hassan type. When toward the beginning of the sixth century the Greeks began to introduce the monumental manner of building, it would be natural that they should be influenced by the Egyptian stone technic with which they must have been familiar. It is not inconceivable, however, that the

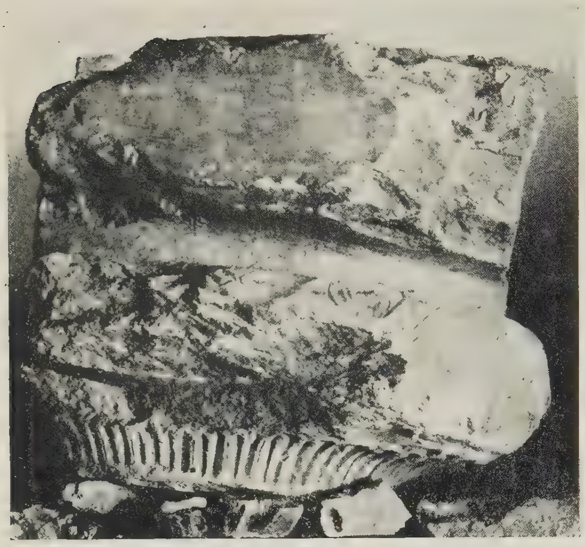

FIGURE 53. FRAGMENT OF A CAPITAL FROM THE "TREASURY OF ATREUS," IN THE NATIONAL MUSEUM AT ATHENS.

fluting may have been independently developed by the Greeks themselves when they began to substitute columns of stone for the Mycenæan wooden type. They not impossibly might have passed by the same stages from the square pier to the eight-sided and then to the sixteen-sided and sixteen-fluted shaft. Such fluting is distinctive of stone, it nowhere can be shown to have existed in wood. It is at least noteworthy that many of the earliest Doric shafts had sixteen flutes (Temple on Ortygia at Syracuse, Assos, one column of the Heræum (the oldest ?), Temples C, D, and S at Selinus, etc.). Occasionally eighteen are found, and after the earliest epoch twenty is the usual number, although in the comparatively late temple on Cape Sunium a return is made to sixteen channels. The development from sixteen flutes came about naturally, almost inevitably: the increase in number was due wholly to sensuous æsthetic considerations. Thus the largest number, twenty-four, occurs when the shaft is of unusually large diameter.

The Doric capital seems in all probability to owe at least the suggestion of its form to the Mycenæan capital, derived in the first instance from that of Crete (cf. Figures 53 and 54). While being led to change the form of the shaft when they began to use stone, it was nevertheless natural that the Greeks should adhere to the general type of capital with which they were familiar, as it was at least equally suited to stone as to wood. Thus the earlier capitals more closely resemble the Mycenæan examples, though already modified and fully adjusted to stone, gradually attaining a form still more suited to the new material, changing with the proportion of the column as the development went on, until, as has been seen, in the fully developed period a form exquisitely adapted to its material as to its purpose had been devised. On the other hand, it may be noted that a series of archaic supports for votive offerings, found on the Acropolis at Athens in the rubbish antedating the Persian wars, — as illustrated by Durm,[1] — suggests the possibility of an altogether independent development of the stone Doric capital.

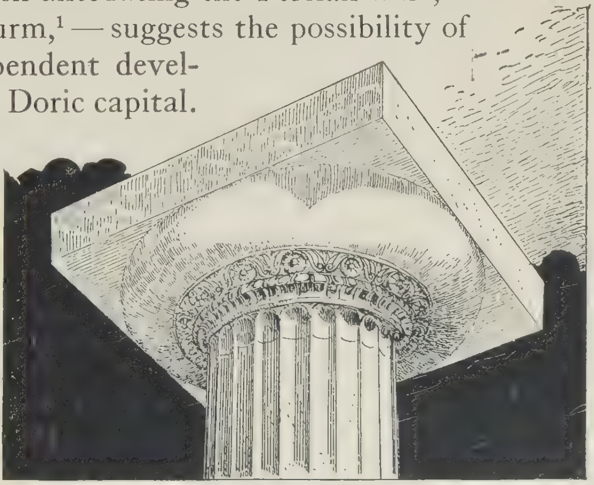

FIGURE 54. CAPITAL FROM THE "BASILICA" AT PÆSTUM.

From J. Durm's "Baukunst der Griechen" (1910), Fig. 250.

The triglyphs in the entablature, though it is absurd to regard them as mere reproduced beam-ends, may possibly, as a motive, have been somewhat remotely

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[1] *Baukunst der Griechen* (1910), p. 253.

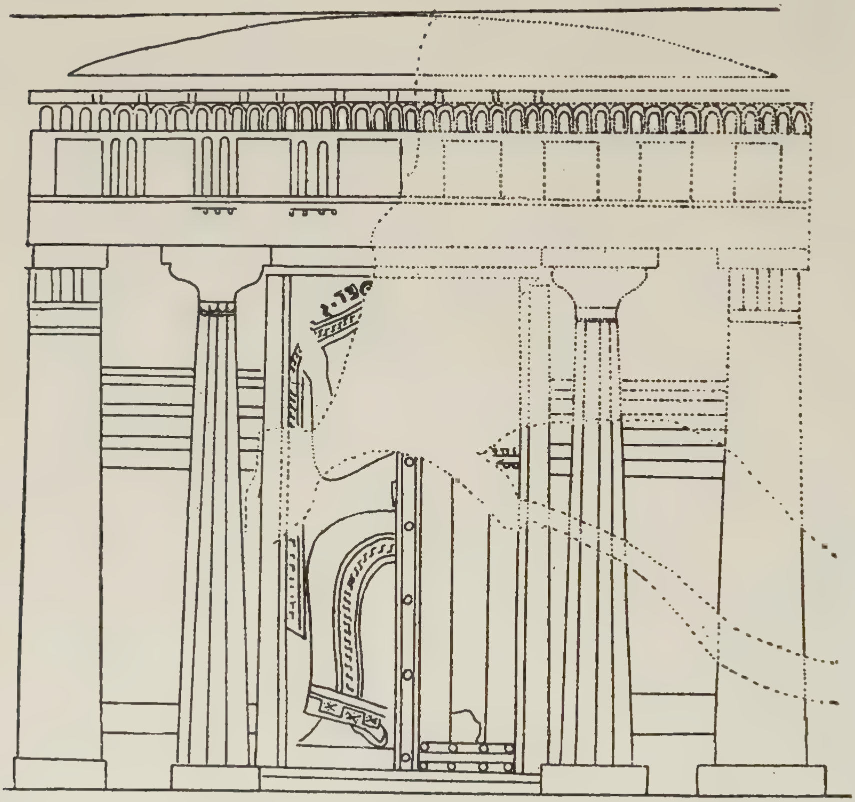

FIGURE 55. FAÇADE OF A DORIC BUILDING ON THE FRANÇOIS VASE.
From "Wiener Vorlegeblätter" (1888), Pl. 2.

suggested by the appearance of the side of the Mycenæan beam-construction.[1] It seems clear that they were conceived decoratively as an echo of the colonnade below. That a suggestion should have been taken from the wooden construction for the decorative treatment of a distinctively stone feature, the frieze, is a very different thing from regarding the triglyphs as mere reproduced beam-ends. There is pretty clear evidence that some early entablatures had no triglyphs in the frieze (Cadacchio on Corfu, Temple in Syracuse, "Temple of Ceres" at Pæstum) and it is quite conceivable that the motive first appeared as a painted decorative motive in the friezes. Durm has already called attention to the possibility of such a motive having been suggested by the painted decorations alternating with cartouches on Egyptian throat mouldings, and some of the representations of buildings in the vase paintings, as in the Corinthian vase found at Cervetri, now in the British Museum, show a decoration of vertical painted lines like those of the Egyptian cornice and suggestive of triglyph channels. A similar decoration is shown in the corona of one of the buildings of the François vase (Figure 55). Such a decoration might easily be due to suggestions coming from more than one source. Once used it would be natural to carve such decoration in relief and ultimately to conceive it as structurally expressive.

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[1] This is the view of Gabriel Leroux: *Les origines de l'edifice hypostyle* (1913), p. 64.

The point to be emphasized in this connection is the real significance and appropriateness of the Doric order as a design in stone, whatever the gradual and perhaps complicated steps by which it was brought to final shape.

PERIODS OF THE DORIC STYLE

The Doric style, during the known course of its history, may be divided into three main periods. These are: *first*, the archaic Doric, of which the oldest known examples hardly go back farther than near the end of the seventh century B.C., and which lasts until somewhere near the end of the sixth or the beginning of the fifth; *second*, the fully developed

Doric, which belongs chiefly to the fifth century with the early part of the fourth; and *third*, the period of decline which centres in the Macedonian epoch under King Philip and Alexander the Great.

In the archaic period the temple plans are long and narrow and the Sicilian temples show a very imperfect development of the pronaos and a threefold division of the length in the interior. They stand on high and bold stereobates which consist often of numerous plinths. The greatest changes from the earlier to the later periods are, however, to be noticed in the general proportions, and in the design of the capitals, particularly with regard to the form and projection of the echinus and the position of the epistyle in relation to the capital. The more archaic examples have columns of very heavy and squat proportion, carrying extremely heavy entablatures, and there seems to be evidence that the triglyphs were sometimes lacking. The capitals were widespreading, with a very bulging and even clumsy echinus, often separated from the necking by a deep hollow or throat-moulding. The capital often has three incisions by way of separation from the shaft, and the shaft occasionally has sixteen instead of twenty flutes. The whole design is elephantine and frequently awkward in many of its details. The tendency throughout the development is on the whole toward greater lightness and relative slenderness of proportion, toward greater delicacy and justness in the profiling of the mouldings, which become more and more tense, until in the period of decline they become rigid and harsh, while the general proportions become so slender that the essential character of the order, its robustness, is largely lost, the result being designs that are dry and comparatively uninteresting.

The proportions may be conveniently compared by using the means of proportioning given by the Roman writer Vitruvius, namely, measuring the proportions of the different parts in terms of the lower diameter of the column. This method of proportioning, however, leaves out of account altogether the important element of the actual scale of execution. Vitruvius was well aware of this and varies his proportions in many cases in relation to the actual size of the building. This is a point which needs to be borne in mind in making use of any means of absolute proportional comparison. A more useful, because more readily apprehended mode of comparing the general proportions is that suggested by Gottfried Semper. It consists in comparing in different examples the rectangles formed by the horizontal line of the top of the stylobate, the vertical axes of the outer of the four central columns of the front of a temple and the horizontal line of the top of the geison. Semper gives to this the name of the "norm" or "normal rectangle." The proportional relations of this rectangle can then be given in terms of the lower diameter of the column. It will be found that in the archaic period this rectangle is wider, usually noticeably wider, than it is high; in the central period it is about square, tending to be slightly higher than it is wide; while in the period of the decline it is distinctly higher than it is wide (Figure 56). At the same time the relative proportion of the rectangle changes as measured in terms of the lower diameter. In the archaic period the vertical height of the norm was only about six to six and three-quarters diameters, with a width of about seven and a half or even eight. In the period of highest development the height and width were about seven or a trifle over; in the period of decline they reached as much as eight, while the width measured in diameters remained about the same.

The proportion of the column varies from three and three-quarters diameters high in the old temple of Corinth to six and one-half in the Temple at Nemea and even more slender in the Hellenistic and Græco-Roman periods.

Two distinct phases of the archaic Doric are to be noted especially in Sicily. In the second of these periods the columns tend to appear spindly and inadequately related to the still very heavy entablature. The effect of proportion is less happy than even in the earlier examples, though the detail shows more refinement.

In the early part of the period of full development — which we must regard as already belonging to it, since all the parts have taken on the essential character which they retain — the tendency is to return to the heavy general proportions of the early examples, but with greater harmony of relations and a much more satisfying general aspect. The so-called Temple of Neptune at Pæstum, for instance, must be regarded as belonging to this period in spite of some archaic characteristics. From this time on the tendency is constantly toward increasing slenderness and relative grace of treatment and to constantly greater refinement in the parts.

The Attic Doric is a special phase of the fully developed Doric. The Attic style not only makes use of Doric and Ionic orders in the same building, but its treatment of each order is modified by the influence of the other. The general proportions of the style are at this period about the same, both within and without Attica. The Attic Doric tendency, however, is to greater slenderness and delicacy, while its detail is characterized by unequalled refinement and beauty.

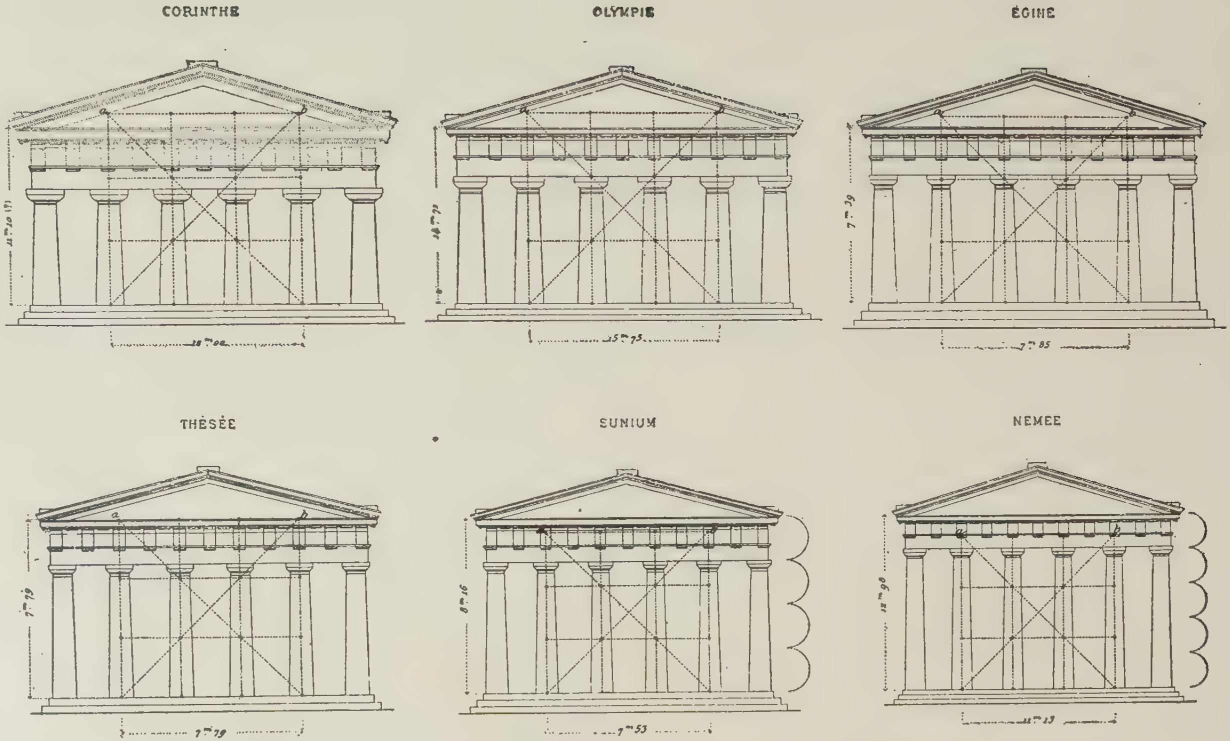

FIGURE 56. RELATIVE PROPORTIONS OF DIFFERENT TEMPLE FRONTS.

From P. Fauré's "Théorie des proportions en architecture" (1892), Pl. 11.

THE DORIC TEMPLES OF THE ARCHAIC PERIOD

When, after the darkness of the Doric migration, the curtain again rises on the pageant of Greek architecture, we see dimly through the veil the colossal masses of temples of stone, rectangular gable-roofed buildings of the distinctively Greek megaron type, surrounded by a peristyle of heavy, closely-spaced, sixteen-fluted shafts crowned by capitals in which the large square block of the abacus is upheld by a widespreading and bulging echinus, separated from the shaft by a deep scotia in which the flutes die out. The epistyle — the ponderous stone lintel, as simple and proportionally more massive than those of "The Temple of the Sphinx" — is nearly a full lower shaft-diameter in height. It is placed so that its face is directly over the line of the upper diameter of the shaft. The development seems to have reached the point at which the triglyph frieze is just coming into being. Triglyphs as yet seem often not to have been used, or if used the regulæ below and the mutules above them have not yet been invented. (Cadacchio; Syracuse; Pæstum: "Basilica" and "Temple of Ceres.") The triglyph is a feature too new for the various adjustments to have been made which later make of it so strangely harmonious an element of Doric design. Its first use seems productive of confusion rather than order. The columns as yet are not drawn in at the angle of the temples, even when triglyphs exist, while the central intercolumn of the front is sometimes much wider than the others. The intercolumniation of the side is often much narrower than that of the front. There is ponderous vigor, but little sense of harmonious proportion. The rhythmic sense of design of the great period does not yet exist. The temples of Greece, at this time, like those of Egypt, were covered with stucco and then decorated with color: strong reds and yellows, brown, black and white. Egyptian influence seems clearly indicated by the character of much of the decoration.

The plans are long and narrow and there is greater variation than we find later. In the Sicilian temples the forms of some early megarons, such as that of Dimini with adyton or rear chamber, are repeated in the subdivision of outer portico, great hall, or cella, and inner shrine (adyton or opisthodomus), while later a return is again made to the simpler division of the megaron — which seems always to have been preferred in the Greek mainland — as more in accord with the Greek views as to their companionable and democratic gods, so different from the aristocratic or rather monarchical divinities of Egypt.

The earlier mixed construction of stone and timber, perhaps protected by terra cotta, still shows its influence in the use of wooden, terra-cotta-protected beams over the ceiling of the pteroma, and in the tendency to face even the stone geison with terra cotta.[1] But in the main these ponderous buildings make the impression of being chiefly primary structures of stone.

Greek architecture was preoccupied, as has already been pointed out, mainly with a single problem, that of the temple. On this all the devotion, all the skill, of generations of artists was lavished. The great success achieved was in large part due to this singleness of aim and to the further fact that generation after generation of builders were content to use in the expression of the temple a single motive, which they gradually wrought to greater and greater perfection. While in the first instance the forms of the temple were derived from the house, in the historic periods the forms used in other buildings (and the requirements of Greek civilization made them few and simple) were derived from the temple in which the real development of the style took place, but were often modified and simplified to meet the different and usually simpler requirements of other structures.

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[1] Koldewey and Puchstein, *op. cit.*, p. 222, connect the use of terra cotta with stone and regard the development of terra cotta and stone technic as contemporary.

Since the Greek temple was regarded as the dwelling of the god, the altar was on the outside, and the building was entered by few. On this account, and also because Greek life was essentially a life out of doors in public places, Greek architecture inevitably became an architecture, if not exclusively, at least chiefly concerned with, the exterior. In this respect it contrasts with the architecture of Egypt on the one side and still more with the architecture of Rome on the other. Because of its strict adherence until Hellenistic times to the megaron type of plan for substantially all its buildings, also, it never approached that larger monumental planning which Egypt had shown and which Rome was to develop in still higher degree.

Of the oldest temples in Greece itself very little remains. Archaic remains have been found on the Acropolis at Athens and elsewhere; but apart from the Heræum at Olympia, the oldest ruins that have come down to our day in any such condition as to give a definite and even partially complete idea as to the form of the ancient buildings are to be found not in Greece itself, but in the colonies of Sicily.

Sicily was naturally a richer country than Greece, so that the Greek colonies in Sicily became the wealthiest cities of the Greek world and were noted for their luxury and splendor.

Their rise to great commercial prosperity seems to have developed a love of magnificence and display, and their buildings came to be noted for their great size and richness rather than for refinement. The largest of the great Sicilian cities, and indeed the largest city of the Greek world, was Syracuse, which is said to have had a population of half a million and a circuit of twenty miles. It was founded in 734 B.C. by the Dorians from Corinth, following a colony which had been sent from Athens about a year before, and which founded Naxos; but the colonization of Sicily was prevailingly Doric, and Syracuse remained the dominant city.

SYRACUSE

Probably the oldest Greek temple, after the Olympian Heræum, of which considerable remains have come down to us is represented by the colossal columns which are still to be seen emerging from among modern buildings in one of the narrow streets on the island of Ortygia at Syracuse. It was probably a temple of Apollo and not, as hitherto designated, a temple of Artemis. It perhaps dates from the first quarter of the sixth century, but may be older. Its heavy and squat columns (about four diameters high) are very closely spaced, so that the norm must have been very nearly square. They are about six and a quarter feet in diameter, but are cut without precision, so that the diameter varies irregularly. The angle columns are no stouter than the others, nor are the corner intercolumns narrower. On the other hand, the central intercolumn of the front is about two feet four inches wider than the others. On the sides the columns are still more closely spaced, so that the intercolumn is only about four feet seven or eight inches. The shafts were probably

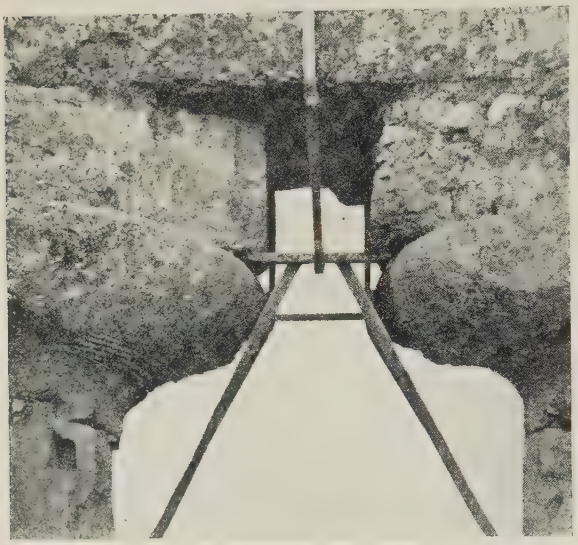

FIGURE 57. THE CAPITALS OF THE TEMPLE OF APOLLO ON ORTYGIA AT SYRACUSE.

without entasis (they are so ruined that this can no longer be determined), but are strongly diminished, the upper diameter being about seven tenths of the lower. They have sixteen flutes. The capitals are very heavy, and their enormous abaci so wide (nine feet two inches) that, closely spaced as they are, they come on the sides of the temples within about twenty inches of each other (Figure 57). The echinus is bulging, and has three annulets with a deep throat or scotia on which the channels die out. The height of the epistyle is about equal to the lower diameter of the shaft. There were no regulæ. Of the frieze and cornice no fragments have been found. If there were triglyphs, it is clear that they must have been most irregularly spaced, and the epistyle is so corroded, especially on the side, that it seems more than doubtful whether the frieze had triglyphs.

The scant vestiges of the Temple of the Olympian Zeus outside of Syracuse are probably not much later in date. The character of the column, which also has sixteen flutes, is similar to that of the Temple of Apollo.

TARENTUM

There are slight remains of a temple which is buried by modern buildings at Tarentum in Italy, and is probably also of very nearly the same date. The remaining capitals show characteristics like those of the Temple of Apollo on Ortygia.

SELINUS: TEMPLES C AND D

Among existing remains probably next in date are the two oldest temples at Selinus, the westernmost Greek colony on the southern shore of Sicily. Selinus was founded in the year 628 B.C. from the Doric colony of Megara Hyblæa, which itself had been founded from Megara in 728 B.C. The earliest settlement occupied the level top of a height between two small streams here flowing into the sea. Rising some one hundred feet above the water this promontory formed the acropolis of the later city. On this site stand the ruins of the oldest buildings. Later the city spread into the broader plateau to the eastward.

The temples at Selinus were first explored by the English architects Angell and Harris in 1823. The following year the French architect J. T. Hittorff, with his pupil Zanth, explored Sicily and published a series of measured drawings, finally resulting in the great work which until recently was the chief authority on ancient Sicilian architecture.[2] Explorations by the Italians Serradifalco, Cavallari, and others, followed. But the definitive study of these buildings and the Hellenic remains in Magna Græcia is the work presented with painstaking and conscientious minuteness by the Ger-

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[1] *Architecture antique de la Sicile* (1870).

man explorers, Robert Koldewey and Otto Puchstein.[1] Since there were few means of conjecturing the original dedication of the Selinuntine temples, Hittorff designated them by letters on his general plan and in his text, and by these letters they have since been generally known. It is to be regretted that Koldewey and Puchstein followed Serradifalco in departing from Hittorff's lettering with regard to the later temples on the eastern plateau, introducing new designations which tend to confusion. In these pages the designations of Hittorff are preferred, though those of Koldewey are added for reference (Figure 58).

Of the two earliest temples (C and D) at Selinus the ruins and fragments remaining (of which some of the more important, including the sculptured metopes with adjoining entablatures of C, are to be seen in the museum at Palermo) are so considerable as to make a fairly complete restoration possible. The two temples have much in common. A comparison of the two makes clear that C must be somewhat the older. Both temples stand on high stereobates and have long and narrow interiors with the threefold division of pronaos, cella, and sanctuary. Both have a very wide pteroma. They have the triglyph frieze, and in both on account of the close spacing there are only half-mutules over the metopes. In other respects they show the triglyph frieze completely developed except as to proportion. In neither is there any narrowing of the angle intercolumniations.

Temple C is hexastyle with seventeen columns on the side.[2] At the top of the stylobate it measures seventy-eight

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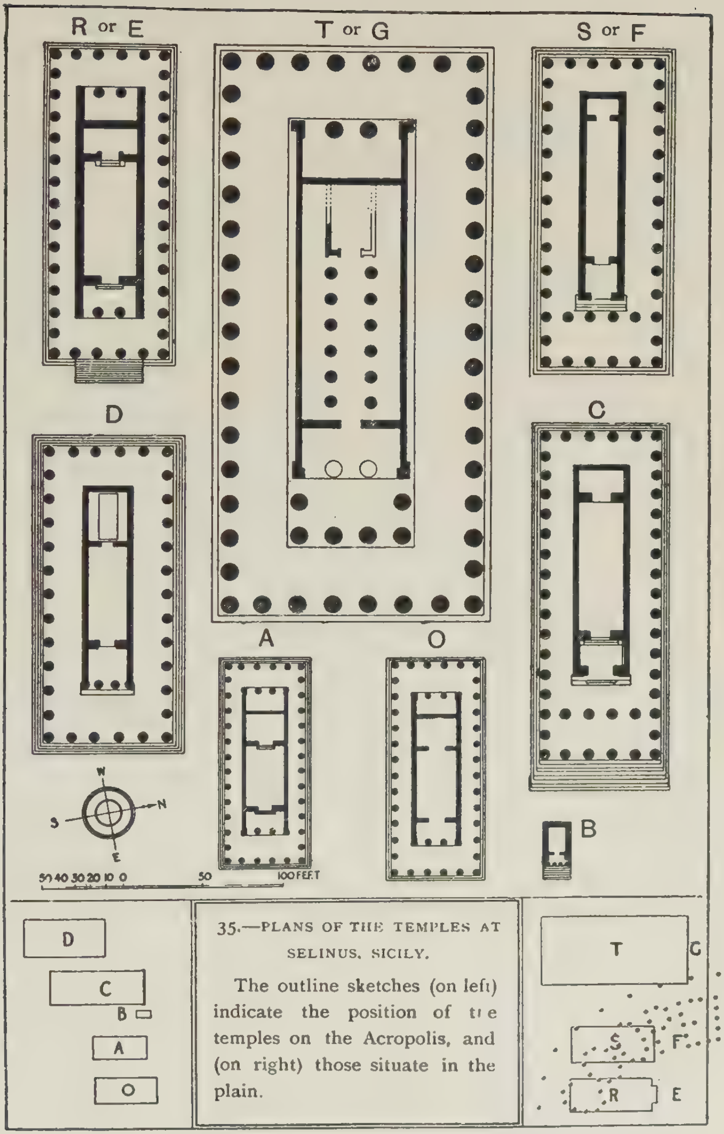
[1] *Die Griechischen Tempel in Unteritalien und Sicilien* (1899). The facts with regard to these temples as here given are based chiefly on this work.

[2] In these numbers the angle columns are always counted twice.



35.—PLANS OF THE TEMPLES AT SELINUS, SICILY.

The outline sketches (on left) indicate the position of the temples on the Acropolis, and (on right) those situate in the plain.

FIGURE 58. THE TEMPLES AT SELINUS.

From W. J. Anderson and R. P. Spiers' "Architecture of Greece and Rome" (1907), Fig. 35.

and one-half feet by two hundred nine feet four inches. It stands on a stereobate of four plinths which are doubled to form practicable steps across the whole front. The spacings of the columns are slightly irregular, as are their diameters. The intercolumniation of the side is some two feet less than that of the front (which is about 14′ 5″ o. c.) and the side columns are about three inches less in diameter than those of the front, which are about six feet two or three inches. The pronaos part is on a line with the fifth side-column from the front. The pronaos is entirely enclosed without any arrangement of columns in antis; but the deep portico is subdivided by a row of columns continuing the line of the third side-column from the front.

Nearly all the columns have sixteen flutes, but there are six of those remaining which have twenty. The columns are strongly diminished, but have no apparent entasis. The capital (Figure 59) is similar to that of the temple of Apollo at Syracuse, but with a finer echinus line, less bulging and not quite so heavy. Below the throat-moulding the capital is separated from the shaft by three incisions. The weakness of the throat-moulding, detaching the upper part of the capital too much from the shaft, was so distasteful to the later Greeks that in this and in other cases the scotia was filled in and hidden in repairing the stucco covering.

The epistyle is nearly as high as the lower diameter of the column, and the face of the epistyle is set over the line of the upper diameter. The tænia of the epistyle is moulded. The regulæ are used here and are somewhat broad, with pronounced cylindrical guttæ.

The frieze is not quite so high as the epistyle. It has very wide triglyphs and very narrow metopes, some of which have

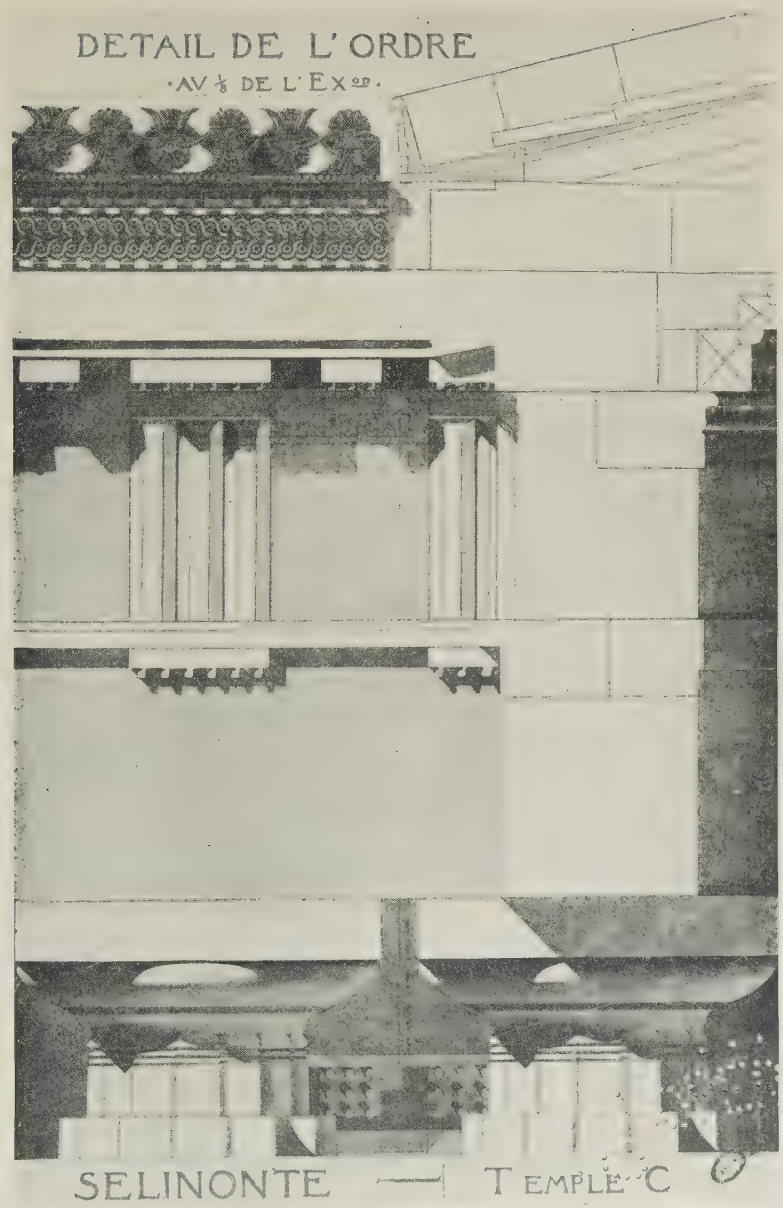


FIGURE 59. DETAIL OF THE ORDER OF TEMPLE C AT SELINUS.

From J. Hulot and G. Fougères' "Selinonte" (1910), p. 221.

the remarkable archaic sculptures already referred to representing the labors of Hercules. Triglyphs and metopes are cut in separate blocks. The channels of the triglyphs are deeply V-sunk and are sharply undercut at the top. They are surrounded by a narrow fillet on the face, the space between them slightly swollen or pulvinated. The angle triglyph is slightly wider than the others, and thus comes to have nearly the same width as the upper diameter of the column. This difference is therefore sufficient, while keeping the triglyph on the angle, to make up entirely for the fact that there is no diminution of the angle intercolumns. The peculiar arrangement of the mutules has been spoken of. Those over the metopes are about two fifths the width of those over the triglyphs, and have three guttæ in the front row instead of six.

Koldewey has shown that above the geison there was another block, the face of which was very nearly of the same height and decorated by an applied band of terra cotta richly ornamented, above which was an open terra-cotta cresting or gutter. He has established also a very peculiar form for the pediment, which was narrower than the front, the slope bending and leaving horizontal terminations at each side. He does not seem fully to justify the further archaic awkwardness of the horizontal cornice under the pediment having the full width given to the side cornice. The entablature was thus more than half, approximately three fifths the height of the column. Owing to this great height of the entablature the norm is nearly square (with Koldewey's double horizontal cornice under the pediment slightly higher than square) in spite of the squat proportion of the column, slightly less than four and a half diameters high.

In spite of archaic crudeness, the great peristyle, with its generous scale, its heavy proportions and rich decoration, must have had an impressiveness which already foreshadowed the beauty of the later temples.

Temple D differs from C in plan in having an open pronaos, distyle in antis, instead of the enclosed vestibule of C (Figure 58). The antæ are replaced by three quarter columns engaged at the end of the walls, so that from the front the pronaos gave the effect of a tetrastyle portico. The four plinths of the stereobate were low enough to form practicable steps. The capitals are even lower and more widespreading than those of C (Figure 60). The columns are about five diameters high, and the entablature nearly as heavy as in C, so that the proportion is less pleasing. The triglyphs are all of about the same width — only slightly less than the upper diameter of the column.

PÆSTUM

Perhaps not far from contemporary with D (Koldewey regards them as younger) are two quite exceptional and very interesting temples at Pæstum on the western coast of southern Italy. They illustrate the degree of fluctuation and variety which characterized archaic design before the canonical system of the maturity had been developed, and in some respects show characteristics which seem to be more archaic than temples C and D of Selinus. Koldewey regards many of these peculiarities as Achæan in contradistinction to the pure Doric, these local or tribal varieties tending to disappear as the style advanced.

Poseidonia — the city of Poseidon (Latinized as Pæstum and Italianized as Pesto) — was founded from the Achæan

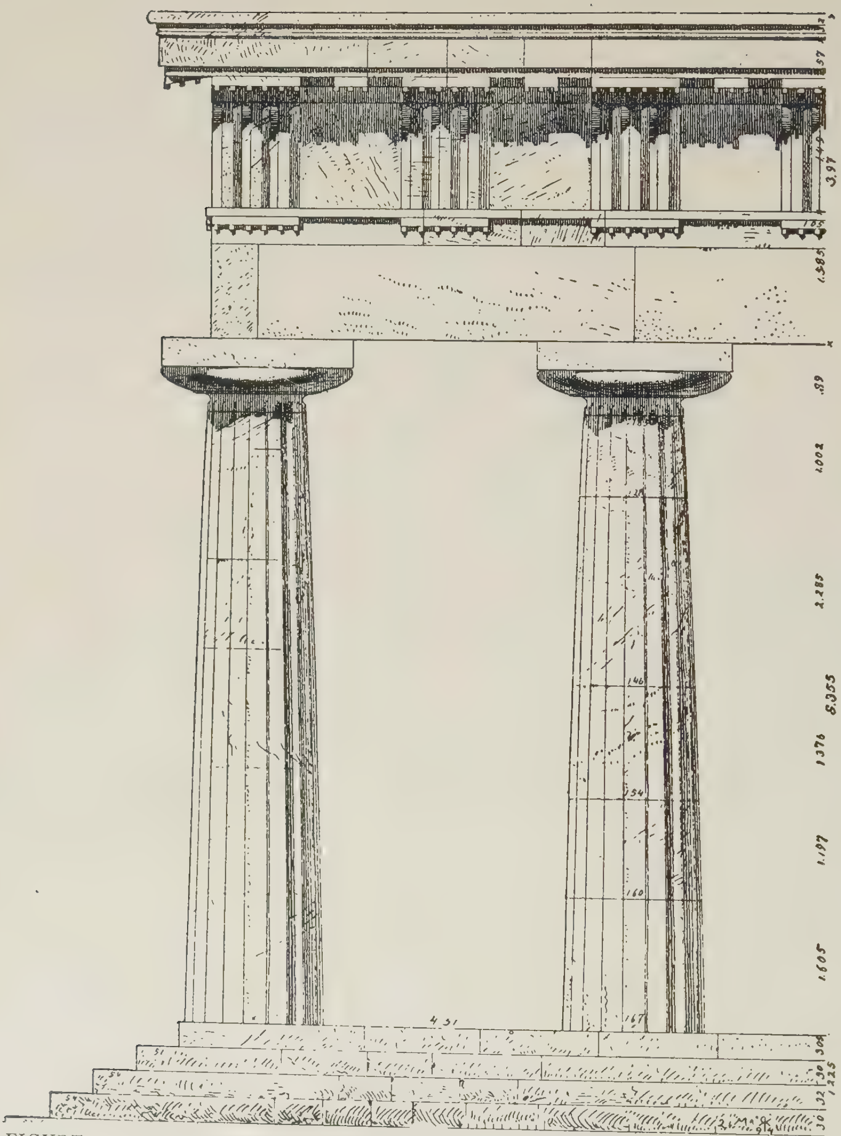


FIGURE 60. ANGLE BAY OF THE SOUTH SIDE OF TEMPLE D AT SELINUS.

From R. Koldewey and O. Puchstein's "Die griechischen Tempel in Unteritalien und Sicilien" (1899), Fig. 81.

colony of Sybaris which lies on the eastern coast of Italy, probably about the year 600 B.C. In the year 273 B.C. it was conquered by the Romans and received a Latin colony; later — in part owing to its malarial climate — it declined, but continued to exist until it was destroyed by the Saracens in the year 871 of our era. The ruins are to-day among the most impressive monuments of Greek civilization. Inside the still visible circuit of the Roman walls which one enters by a superb and simple arched gateway, stand in the midst of meadow and pasture the remarkably preserved remains of three great temples. They seem all the more imposing because of their isolation in the midst of the level plain stretching to the not distant sea and backed by great hills.

Of these three temples, two belong distinctly to the archaic period and to an early portion of that period. The oldest of these is known as the "Basilica," because the earlier investigators believed from its peculiar and but partially explored plan that it was a secular hall, a basilica rather than a sacred building. It has now been quite clearly shown to be a temple. Some distance in front the ruins of its great altar still exist. It was an enneastyle building having eighteen columns on the sides with pronaos tristyle in antis (Figure 61). A row of seven columns on the axis of the cella divides the interior with two aisles. It is not clear whether it had a sanctuary in the rear of the cella and opening from it, or whether the foundations here existing are those of an epinaos. The whole of the external colonnade with its epistyle blocks, the columns and antæ of the pronaos, and three columns of the interior remain standing. The peristyle rests upon a stereobate of three plinths. The columns are evenly spaced, there is no narrowing of the corner intercolumns. The shafts diminish

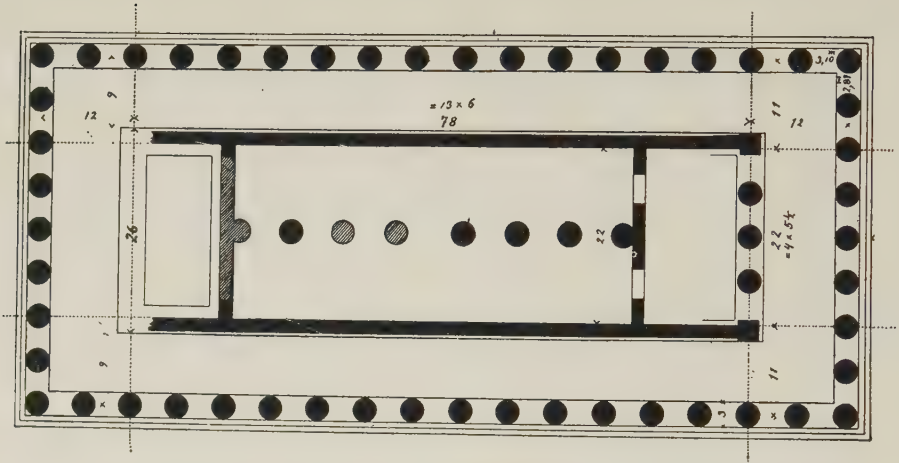


FIGURE 61. PLAN OF THE "BASILICA" AT PÆSTUM.
From R. Koldewey and O. Puchstein's "Die griechischen Tempel in Unteritalien und Sicilien" (1899), Fig. 15.

strongly, with a bulging entasis, and have twenty somewhat carelessly spaced channels. The capitals are very wide-spreading, the abaci having a width of approximately one and a half lower diameters. The echinus is very full in outline, and in place of annulets has an astragal and flat cyma, below which the deep scotia is decorated with carved leaf-forms which vary in different capitals (Figure 54). Such sculptured enrichment is quite unusual in the Doric style. The flutes of the shaft end in elliptical lines before reaching the throat of the capital. The antæ diminish almost as much as the shafts of the columns, and have very peculiar capitals strongly reminiscent of those Egyptian pier-capital forms which followed the scheme of the throat-moulded cornice. The epistyle was crowned by a broad moulding by way of tænia. There are no regulæ. Of the frieze only a few blocks of the inner courses remain. The even spacing of the columns and the absence of regulæ suggest that there may have been no triglyphs; but the failure to use regulæ is not conclusive on this point. The temple measures at the stylobate slightly more than ninety feet across the front with a length of one hundred and seventy-eight. The scale therefore is generous, the columns averaging more than five feet in diameter. The shaft is built of numerous unequal drums.

The second archaic temple of Pæstum, the so-called "Temple of Ceres," is much smaller. At the top of the stylobate it measures only about forty-seven and a half feet across the front with a length of one hundred and eight feet. It is a hexastyle temple with thirteen columns on the side (Figure 62).

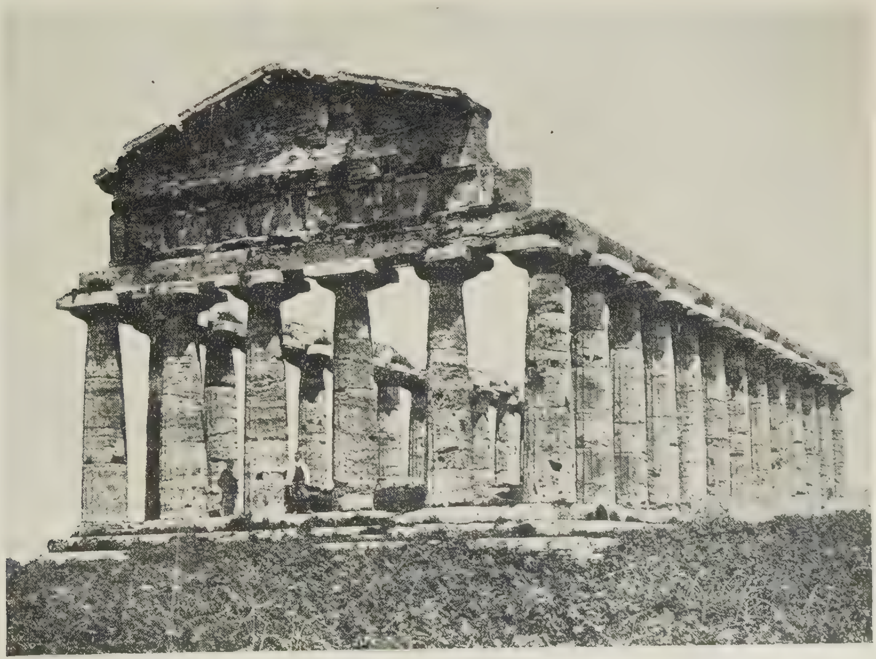


FIGURE 62. THE "TEMPLE OF CERES" AT PÆSTUM.

The shafts have a lower diameter of about four feet one inch and the columns are about four and three quarters diameters high. The shafts are less strongly diminished, and have a more delicate entasis than those of the Basilica. The capitals are similar, but with a better line in the echinus and not so high an abacus. The flutes end either sharply on the astragal below the scotia of the necking, or in other cases against the astragal, with delicate elliptical curves, between which the arrises of the flutes are carried up as tongues. The Temple of Ceres is better preserved than the Basilica. Portions of both pediments remain, the western pediment almost complete, but for the total ruin of

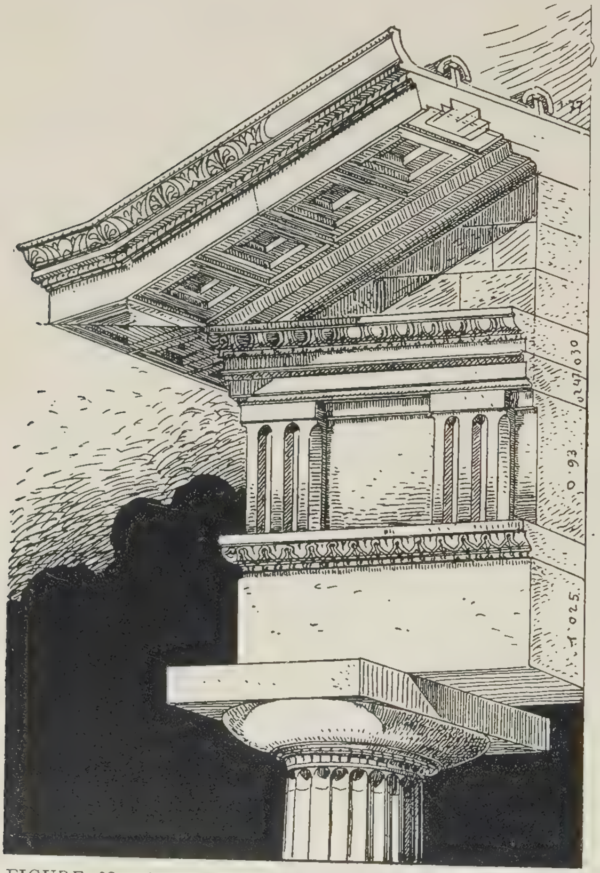


FIGURE 63. ANGLE OF THE PEDIMENT FROM THE "TEMPLE OF CERES" AT PÆSTUM.

From J. Durm's "Baukunst der Griechen" (1910), Fig. 250.

the corners. The epistyle, like that of the "Basilica," was crowned with a broad moulding which perhaps was carved; nor here either were there any regulæ. The frieze was built in blocks of which the joints came over the centre of each column and each intercolumn. Sinkages have been cut at each joint into which flat slabs, proportioned and undoubtedly cut like triglyphs, were inserted. A single badly disintegrated example remains in place. On the sides of the temple nothing of the frieze remains, but, as Koldewey suggests, excavation would doubtless reveal many of the missing parts. The single remaining triglyph plate is of a different, softer stone than the rest of the temple, and it seems highly probable that these plates were later insertions in order to give a triglyph-less frieze the aspect of the later temples. As the spacing of the columns is throughout equal, the angle metope must have been wider than the others. The pediment also shows marked peculiarities (Figure 63). The horizontal cornice under the pediment seems to have consisted of a but slightly projecting group of mouldings, while the cornice of the sides seems to have turned and followed up the rake of the pediment, showing a thin geison of very broad projection, coffered underneath in such a way as to suggest wooden panelling. Unlike the typical Doric cornice, this corona is distinctly suggestive of wooden originals.

The plan is also peculiar and shows an arrangement which, since it so closely resembles that of Etruscan and later Roman temples, one is inclined to suspect may be due to Italic influence (Figure 64). There is no epinaos nor rear sanctuary, while the pronaos is tetrastyle, prostyle, with two intercolumniations returning on each side on a line with the side walls, the whole forming a deep portico like that of the Roman

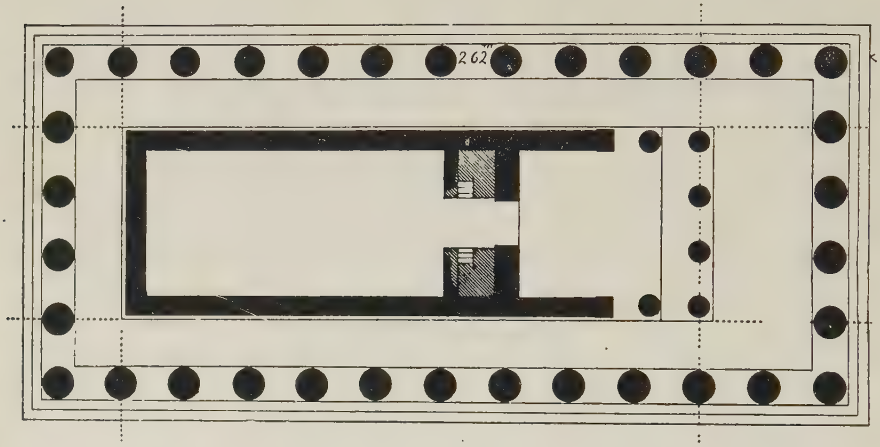


FIGURE 64. PLAN OF THE "TEMPLE OF CERES" AT PÆSTUM.
From R. Koldewey and O. Puchstein's "Die griechischen Tempel in Unteritalien und Sicilien" (1899), Fig. 23.

temples. The pronaos columns were made smaller than those of the peristyle. In front of this temple, as in front of the "Basilica," is a ruined altar.

METAPONTUM

Somewhat later, and belonging apparently to that second phase of the archaic style which is transitional to the period of full development, are the remains of two temples at Metapontum. They may be dated perhaps somewhere near the year 530 B.C.

Metapontum is situated on the east coast, as Pæstum is on the west coast, of southern Italy, and like Pæstum was in relation with its neighbor Sybaris, but probably was directly colonized from Greece.

One of the two ruins, situated some three miles outside of the city, is locally known as the *Tavole Paladine*, the table of the Paladins. The other, probably a temple of Apollo, and preserving still more meagre remains, is situated within the circuit of the ancient town itself, and is called the *Chiesa di Sansone*, the church of Samson. Of the first, which was a small hexastyle temple with twelve columns on the side, fifteen well-preserved columns of the peristyle, including one of the corner columns, remain standing. They were evenly spaced, the small scale allowing a rather wide intercolumniation. The shafts are rather strongly diminished with a slightly bulging entasis and have twenty flutes. They still retain considerable remains of their stucco covering. The style here has so far progressed that all that is now left of the scotia

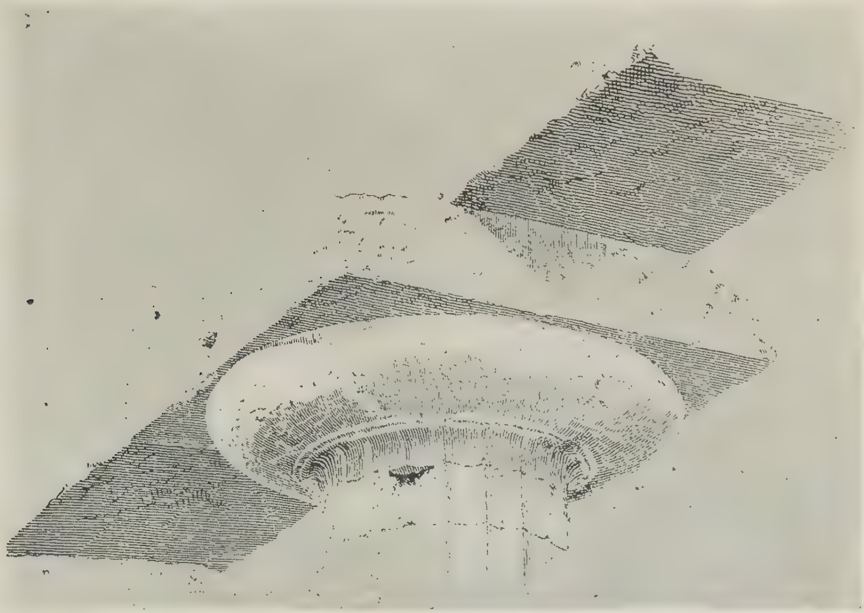


FIGURE 65. CAPITAL FROM THE TAVOLE PALADINE.
From R. Koldewey and O. Puchstein's "Die griechischen Tempel in Unteritalien und Sicilien" (1899), Fig. 35.

below the echinus is a hollow in which the flutes end on the lower of the two annulet fillets (Figure 65). The echinus is not unlike that of the Temple of Ceres at Pæstum. Neither the upper blocks of the epistyle (which, like that of the Ceres temple, seems to have been in two horizontal courses) nor anything of either frieze or geison have been found. Fortunately, of the *Chiesa di Sansone*, which was a somewhat larger building, enough fragments of the entablature have been unearthed to show that there were no regulæ, but that there was a triglyph frieze, in spite of the fact that the corner intercolumniations were not diminished. As the style of the capitals is similar to that of the *Tavole Paladine*, we may perhaps assume a triglyph frieze, but no regulæ on the epistyle, for that building also. In both these structures as in the Ceres temple and Basilica at Pæstum the epistyle blocks were mitred at the angles of the building. Among the interesting finds at Metapontum are a series of beautiful terra-cotta cymatia, ceiling plates, and roof tiles belonging to the second of the two temples. The comparatively slender columns, over five and a half diameters high, and the relatively low capital with carefully profiled echinus (in the *Chiesa di Sansone*, however, with a very high abacus), show a striving after elegance of style which seems to characterize buildings of this period, and which is also shown in the two buildings at Selinus, probably not far from contemporary, which must next be considered.

SELINUS: TEMPLES S AND T

These two temples are situated on the plateau to the eastward of the acropolis of Selinus (Figure 66). One of them, Temple S (F), is very nearly the same size as temples C and

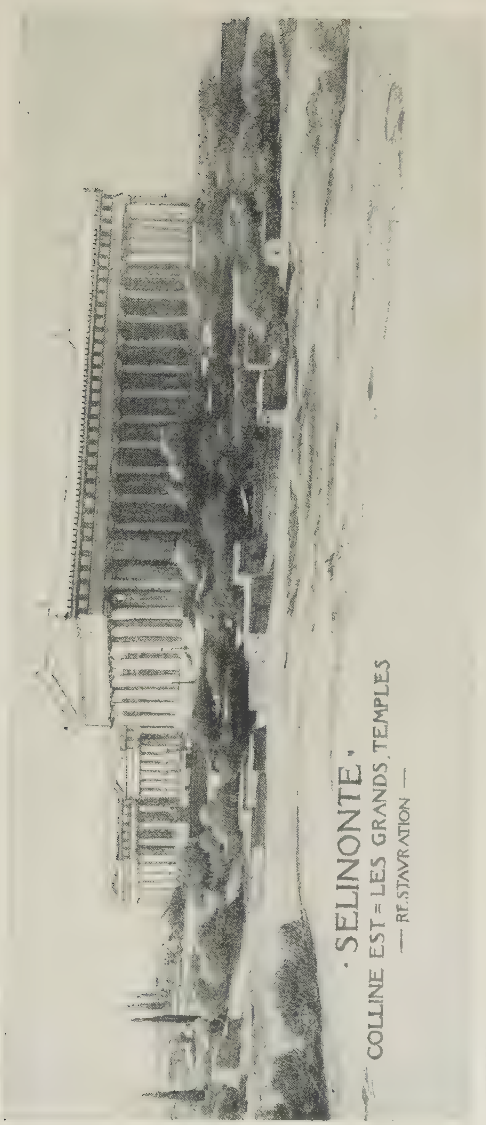

· SELINONTE ·
COLLINE EST = LES GRANDS TEMPLES
— RESTAVRATION —

FIGURE 66. THE TEMPLES OF THE EASTERN PLATEAU (R, S, AND T) AT SELINUS, RESTORED.

From J. Hulot and G. Fougères' "Selinonte" (1910), Pl. 11.

D. The other, known as T (G), is one of the largest of ancient Greek temples. The plans of both still show marked archaic characteristics. The somewhat low and widespreading capitals and the comparatively wide spacing make the columns less satisfactory than the more archaic examples. Both temples still retain the scotia below the echinus, and in this respect seem more archaic than the two temples at Metapontum. On the other hand the shafts of both have twenty flutes, the entablatures already show the normal forms of the full development: epistyle with tænia, regulæ and guttæ; triglyph frieze in which the metopes approach the square and are distinctly wider than the triglyphs; and cornice with fully developed mutules.

Temple S is hexastyle with fourteen columns on the sides, and the peristyle stands on a stereobate of four plinths. The cella was long and narrow, the wide pteroma and the general arrangement resembled that of Temples C and D. As in C a colonnade runs in front of the pronaos across from side to side in the line of the third column from the corner. Whether as in C the pronaos was wholly enclosed and entered by a door, or whether it was distyle in antis, can no longer be made out. In spite of the existence of the triglyph frieze, there was no reduction of the corner intercolumns. The columns are very strongly diminished, the upper diameter below the scotia of the capital is only about two thirds of the lower (Figure 67). It is doubtful whether there was any entasis. This gives to the columns a spindly and somewhat unpleasant proportion. The echinus is unusually low and widespreading, producing a weakness in the effect of the capital. The profile, however, is delicately felt, and has not the awkward bulge of the more archaic examples. Of the entablature, the carved metopes

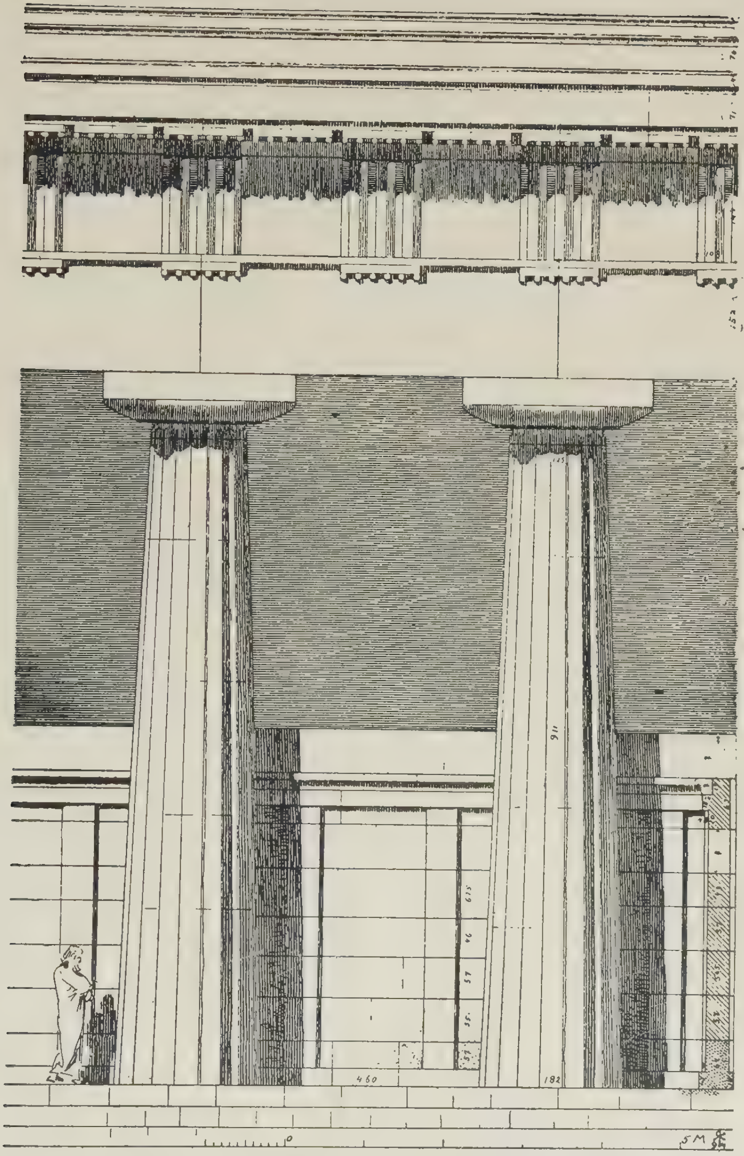


FIGURE 67. SELINUS. TEMPLE S. BAY OF THE SOUTH COLONNADE.

From R. Koldewey and O. Puchstein's "Die griechischen Tempel in Unteritalien und Sicilien" (1899), Fig. 94.

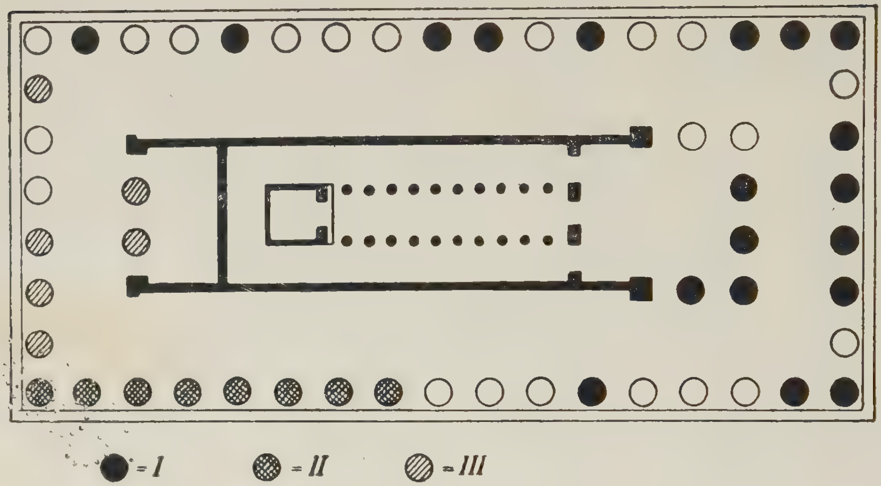


FIGURE 68. PLAN OF TEMPLE T AT SELINUS, SHOWING THE DISTRIBUTION OF THE THREE TYPES OF CAPITALS.

From R. Koldewey and O. Puchstein's "Die griechischen Tempel in Unteritalien und Sicilien" (1899), p. 124.

of the front are now preserved, like those of C, in the museum at Palermo. They are still archaic but show a great advance in those of C. The cornice had a high and vertical cymatium of terra cotta, crowned by a group of mouldings. The most remarkable feature of the temple is the screen, — a thin panelled wall of stone about fifteen feet high, — which filled in the intercolumns of the whole peristyle to half the height of the column.

The great Temple T, probably a temple of Apollo, was, as has been said, one of the largest of antiquity. It was about three hundred and sixty-five feet in length and one hundred and seventy feet across the front. It was an octastyle temple with seventeen columns on the side (Figure 68). The tetrastyle pronaos is formed somewhat like that of the

Temple of Ceres at Pæstum. There was an epinaos distyle in antis which, however, is of later date and may indicate a change in plan. There were columns dividing the interior into three nearly equal aisles. At the western end of the cella was an enclosed sanctuary having just the width of the narrow central aisle.

Apart from its great size interest centres in the fact that the huge structure, which was never completed, shows three distinct periods of construction. Two of these periods fall in the later portion of the archaic epoch, the third shows the characteristics of the time of full development. The city was taken and destroyed by the Carthaginians, B.C. 409, and although after that disaster Selinus continued a poor existence, no more work seems to have been done in the great temple. Its completion was probably far beyond the means of the impoverished Selinuntines. It is astonishing to realize what the colony in the two short centuries of its flourishing youth and prime had accomplished.

The eastern front of the temple, most of the northern colonnade of the peristyle, and a part of the southern were the work of the first period of activity, probably beginning with the last quarter of the sixth century. The southern side was completed, so far as the main structure is concerned, in the second period, while the western front and the epinaos belong to the time of full development, and the work was still going on when the Carthaginians suddenly fell upon the doomed city. That the attack was sudden is made evident by the fact that some blocks were found where they had been left part way from the quarries. The quarries themselves, some three miles from the city, still show partially quarried blocks intended for the great temple, some of them not yet detached from the living rock. This fact, and the unfinished condition of the temple itself, throws the most interesting light on the technical processes of the Greek masons. The great stones were enframed with wooden blocks forming wheels; plugs to serve as axles were inserted into sockets cut in the ends of the stones, which were then trundled to the site like colossal garden-rollers. The stone is a volcanic limestone of very tenacious grain, and the huge blocks in which it is possible to quarry it may very likely have tempted the builders to undertake a temple which should surpass in size anything which the Greek world had yet accomplished.

The capitals of the two periods of construction of archaic time both have the scotia below the echinus. The earlier capitals are more widespreading. The later have less spread and a better, less bulging, line in the echinus.

The earlier archaic shafts are unusually slender, over six and a quarter diameters in height (Figure 69). No other Greek columns approach such proportions until the period of decline is reached. This is undoubtedly due to the great scale (the lower diameter of these slender columns is slightly over eight feet and a half), and to the fact that the front is octastyle. The diminution is slight, again an exception at so early a period, and there is no entasis. The upper diameter is about six feet three and a half inches in these columns. Those of the second period diminish somewhat less, having an upper diameter of almost seven feet. The entablature has already reached almost the normal form and proportion of the fully developed period. It varies little in the three epochs of the building. Koldewey is undoubtedly right in ascribing the great height of the epistyle, the heavy mutules, and the high, closely-spaced guttæ to the great scale of the building which lifted the entablature too great a height above the eye.

The columns of the pronaos remain with the flutes not yet cut. The antæ of the pronaos project enormously from the walls. The interior columns of the cella are of decidedly smaller diameter (three feet eight inches). Their shafts were monolithic. The flutes were never cut, but the necking of the heavy, throat-moulded capitals shows sixteen flutes. Some of the shafts are of polygonal form, showing a stage of work preparatory to cutting the channels.

Such were the archaic temples of Greece and of the West, still tentative in some respects, but tending to adopt uniformly those features which the continual process of experiment showed to be the most satisfactory.

THE DORIC TEMPLES OF THE PERIOD OF FULL DEVELOPMENT

Emerging from the hesitancy of archaic essays, the temples of the fifth century show a uniformity which betokens full development. The double-ended cella with pronaos and epinaos in antis became constant. The interior was now never divided by a single central range of columns, but, if divided at all, had two ranges creating three aisles. The form of the entablature was practically invariable, with square metopes and narrow triglyphs which everywhere brought about the contraction in the spacing of the corner columns — uniform on front and sides. Most characteristic of all, the old bulging echinus was discarded for one with a steeper, firmer profile, and the hollow at the necking was entirely abandoned. It should not be thought, however, that with

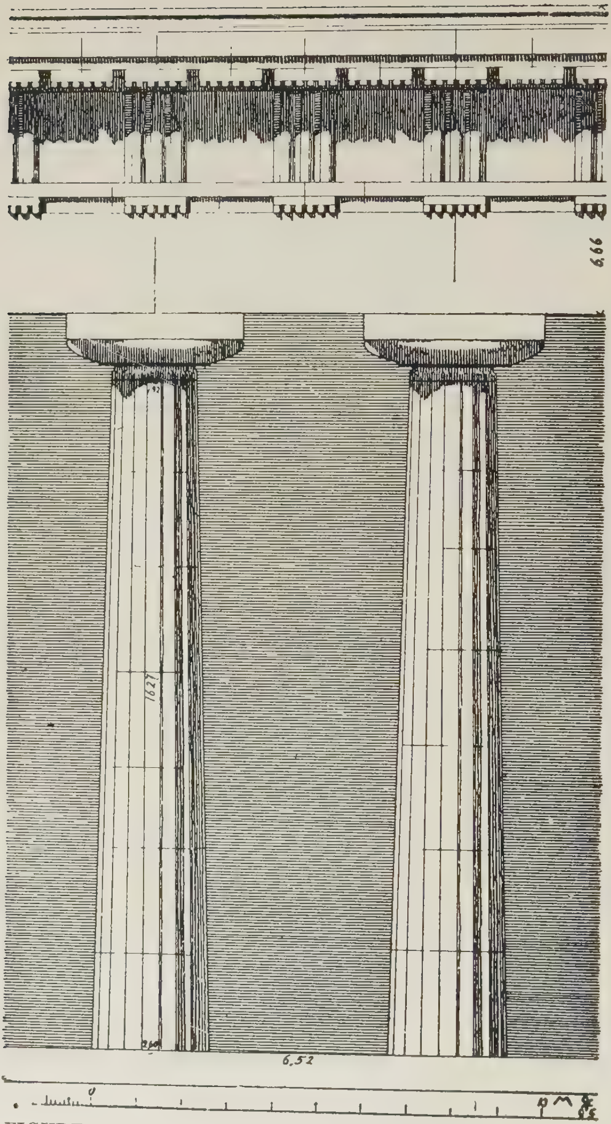


FIGURE 69. ONE OF THE EARLIER BAYS OF TEMPLE T AT SELINUS.

From R. Koldewey and O. Puchstein's "Die griechischen Tempel in Unteritalien und Sicilien" (1899) Fig. 106.

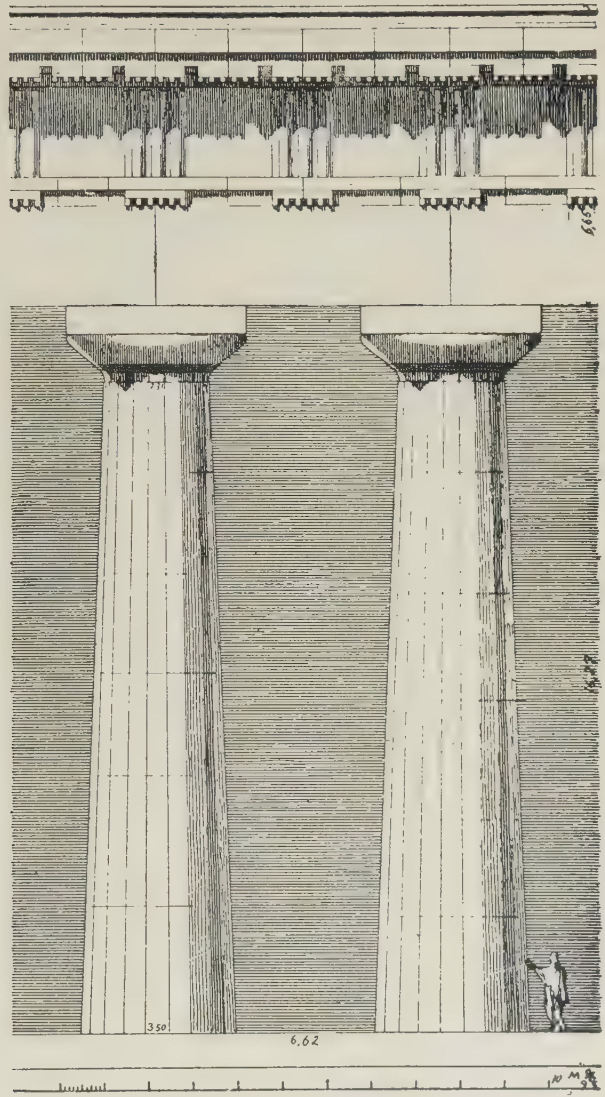


FIGURE 70. ONE OF THE LATER BAYS OF TEMPLE T AT SELINUS, FROM THE WEST FRONT

From R. Koldewey and O. Puchstein's "Die griechischen Tempel in Unteritalien und Sicilien" (1899), Fig. 105.

the solution of its more obvious problems Doric architecture stagnated, or that temples henceforth repeated one another monotonously. The attention of designers was now left free for a subtler study of proportions and refinements, and for the endowment of their works with an individual impress of harmonious massiveness, moderation, or elegance.

SELINUS

A comparison of the latest work on the great temple (T) at Selinus with that of archaic times in it is helpful in fixing the characteristics of the successive periods (Figures 69 and 70). In view of the slow rate of progress in its construction we must conclude that the design even of the western portico had been fixed long before 409 B.C., when the attack by the Carthaginians brought the work to an end. The characteristics are those of the early part of the period of full development. The capitals of the epinaos and of the western front have less spread than the earlier capitals, they have no scotia in the necking, and the line of the echinus is firm and delicate. The columns are much heavier and more strongly diminished. Their lower diameter has the enormous size of eleven and a half feet, and the upper diameter is about seven feet seven inches. Their proportion is therefore comparatively squat, about four and two-thirds diameters high. They thus show clearly the tendency of the early period of full development to make the proportions not only heavier than in the later archaic period, but to use even sturdier proportions than were common in the most primitive period of the Greek Doric. It is to be noted also that, while the columns of the older parts of the building are evenly spaced at the angles as elsewhere, those of the front have the angle intercolumns strongly reduced.

There are at Selinus, besides a small tetrastyle-prostyle shrine, fantastically and arbitrarily mis-restored by Hittorff and called by him the temple of Empedocles, remains of three other temples of the period of full development, which although considerably later in date than those of Corinth and Pæstum, presently to be considered, may well be considered here. All of the three are hexastyle, have the inner shrine separated from the main cella, but also have an epinaos distyle in antis. One of them, Temple A, has remains of circular staircases within the cella to right and left of the entrance. It shows, like the earlier temples, the floor of the cella higher than the pronaos, and the inner shrine still higher than the cella. Its characteristics are closely repeated by Temple O and by Temple R (E), probably a temple of Hera. The beautiful carved metopes, belonging to the pronaos and epinaos entablatures of Temple R, now preserved in the museum at Palermo, were — like those of C which stand near them — discovered by the English architects Harris and Angell in 1823. The finished character of this sculpture indicates a date about contemporary with the Temple of Zeus at Olympia. The feet, arms, and hands, and the heads and necks of the female figures are of white marble, while the remaining sculpture is of limestone. This would indicate that while the rest of the metope was colored, the naked portions were left in the marble and at most stained. The column drums are covered with a fine white stucco and remains of color were found in the entablature. The tænia of the epistyle was red, the triglyphs were blue, and fragments of black and red meanders on a yellow ground were found.

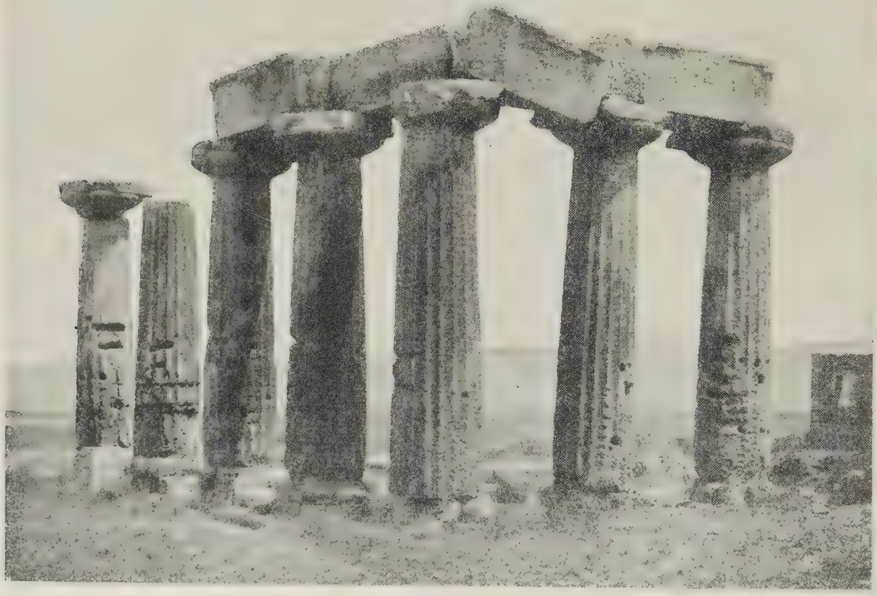


FIGURE 71. THE TEMPLE AT CORINTH.

The capitals of Temple R are similar to those of the great temple, and its columns are even more squat. Moreover the line of the epistyle is still over the upper diameter of the shaft, and not, as generally in the later temples, beyond it. But the date indicated by the advanced character of the sculpture in the metopes of Temple R allows us to infer that in Sicily the development of architectural form lagged behind that of the mother country.

CORINTH

The priority of developments in Greece itself may well be seen in the Temple of Corinth. The columns here have almost the squat proportions of the earliest archaic temples such as that on Ortygia at Syracuse (Figure 71). In the temple of Corinth the height of the columns of the front is four and one-half lower diameters, of the temple in Ortygia about four. Mainly for this reason it used to be regarded as the oldest of Greek ruins. It is probably, however, to be classed as the earliest known example of the period of full development, or it might perhaps be looked upon as a transitional example. Dörpfeld, whose excavations revealed its plan (Figure 72), regards it as belonging to the sixth century or perhaps even earlier; but the character and proportions of the plan, with its narrow pteroma, the excellent line of the echinus, which although widespreading is well-proportioned, the absence of scotia in the necking, the fact that the front line of the epistyle lies beyond the upper diameter of the shaft, all seem to show distinct advance over the more archaic examples. The determination of an approximate date is, however, rendered more difficult by the entire absence of any

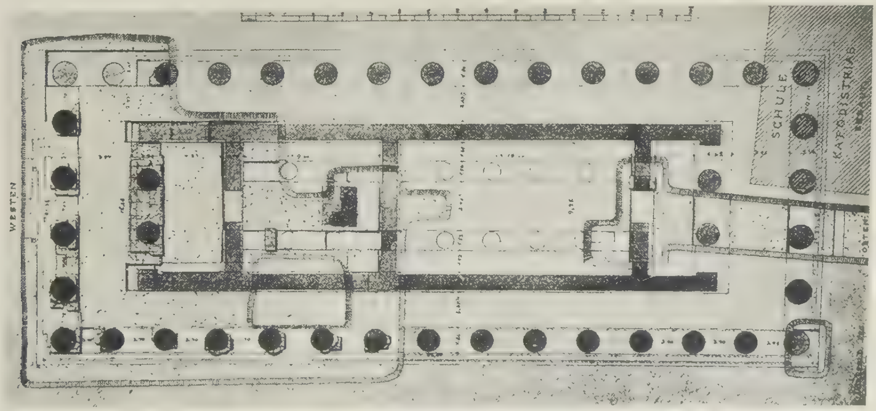


FIGURE 72. PLAN OF THE TEMPLE AT CORINTH.

From the drawing by W. Dörpfeld in "Athenische Mittheilungen," Vol. XI (1886), Pl. 7.

remains of the entablature above the epistyle, which has tænia and regulæ of normal form. The arrangement of the plan of the peristyle shows careful preparation for the triglyphs. The angle intercolumns are made narrower, the central intercolumn of the west front is slightly wider than its neighbor, and this together with the delicate adjustment of the intercolumns of the front, and the upward curvature of the stylobate, are further evidence of advancement of style.[1] We may perhaps conjecture its date to have been toward the close of the sixth century.

The temple is of generous scale (about seventy by one hundred seventy-four feet) and is hexastyle with fifteen columns on the side. The columns of the side have a smaller diameter than those of the front (1.63 m. as against 1.72); but on the side also the angle intercolumns are reduced (3.48 against 3.70), facts which point to the probability that the triglyphs of the side were also narrower than those of the front. The shafts are monolithic, have no entasis and but slight diminution. They have twenty flutes. The capital is divided from the shaft by three incisions, of which the lower forms the joint. The material is a local porous limestone, which was originally covered with stucco. Seven of the columns alone remain standing. Although the foundation walls have for the most part disappeared, Dörpfeld's excavations, which were carried down to the living rock, not far below the surface on which the temple stands, showed clearly where the walls originally were, the rock having been smoothed to prepare for them. The temple seems to have had interior colonnades, and a rear chamber opening from the epinaos. Both pronaos and epinaos are distyle in antis and normal.

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[1] The figures of the intercolumniations of the west front as given by Dörpfeld are as follows: Central intercolumniation 4.02 m.; adjoining intercolumniation 4.00, angle intercolumniation 3.70. Curvature of stylobate: two center columns of west front are 2 cm. higher than the corners. The lower of the three plinths is cut out of the living rock.

PÆSTUM: THE GREAT TEMPLE

Perhaps the most typical example of the early period of full development, one of the best preserved and one of the most impressive of Greek ruins, is the great temple at Pæstum, the so-called Temple of Neptune (Figure 73). The situation of this majestic and awe-inspiring monument of Greek civilization has already been described in connection with the two archaic temples which flank it at unequal distances. Its ample size — the stylobate measuring nearly one hundred ninety-seven feet in length and nearly seventy-nine feet across the front — and still more its robust and harmonious proportions give an impression of firm and virile strength and beauty which is unsurpassed. The stylobate shows a slight curve. The columns have a lower diameter of six feet nine and one-half inches, and are about four and one-third diameters in height. They are diminished and have a marked but not exaggerated entasis. The capital is somewhat widespreading but of fine outline. There are four annulets, and three incisions below the necking. The line of the epistyle is over the upper diameter. The shaft has twenty-four flutes. In other respects the forms are normal. The angle intercolumns are diminished, the variation being distributed over two intercolumns on each side of the corner. The spacing of the columns of the front is therefore similar to that of the temple of Corinth. The columns of the peristyle do not stand quite vertical but are all slightly inclined inward toward the cella walls. The cella floor is raised considerably

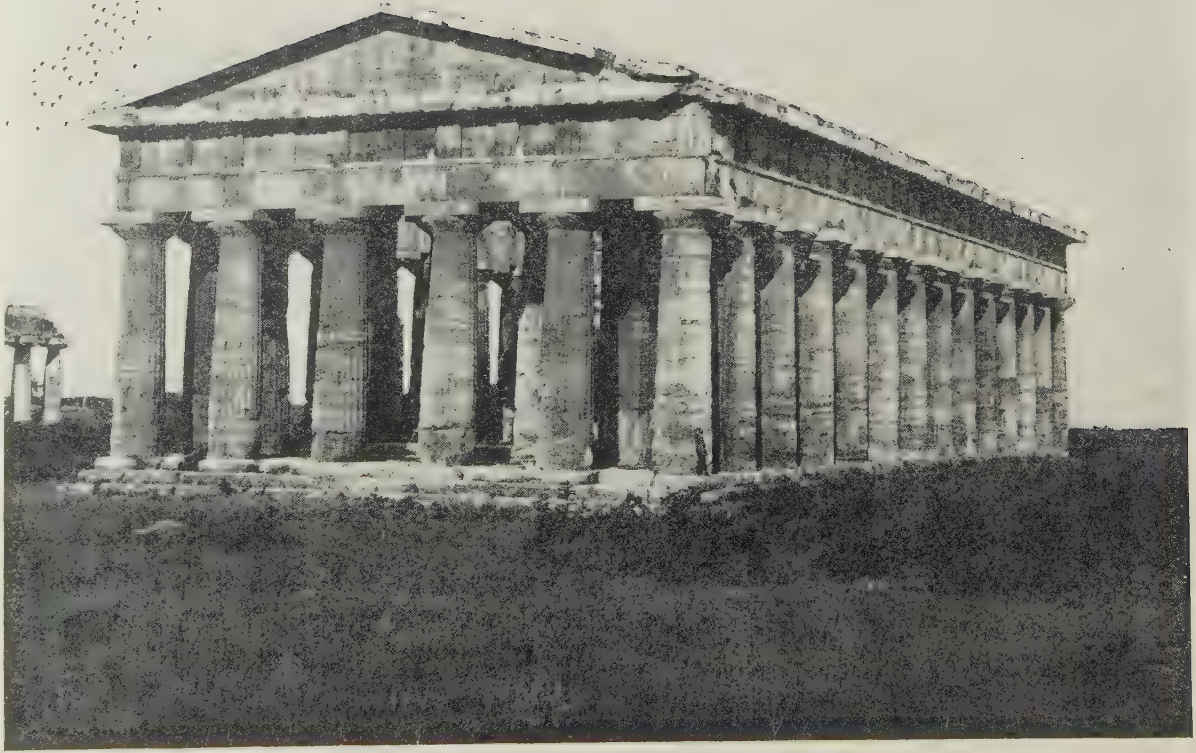

FIGURE 73. THE GREAT TEMPLE AT PÆSTUM.

above the floor of the pteroma. The temple is hexastyle with fourteen columns on the side, and has the normal plan of pronaos and epinaos with distyle in antis (Figure 74).

Apart from its excellent general preservation and majestic beauty, the ruin is most noteworthy in that it is the one remaining example of a temple which had interior colonnades in which any portion of these colonnades still stand (Figure 75). These colonnades were in two stories. The columns of the lower story are all in place, and still carry their complete epistyles. Of the upper colonnades three columns remain standing on one side and five on the other, still carrying their epistyles. The straightforwardness and logic of the construction is remarkable. There are no structurally unnecessary members. The upper colonnades rest directly on the epistyle of the lower columns, their lower diameter is slightly less than the upper diameter of the columns below. The columns of the lower colonnade have twenty flutes, those of the upper have sixteen.

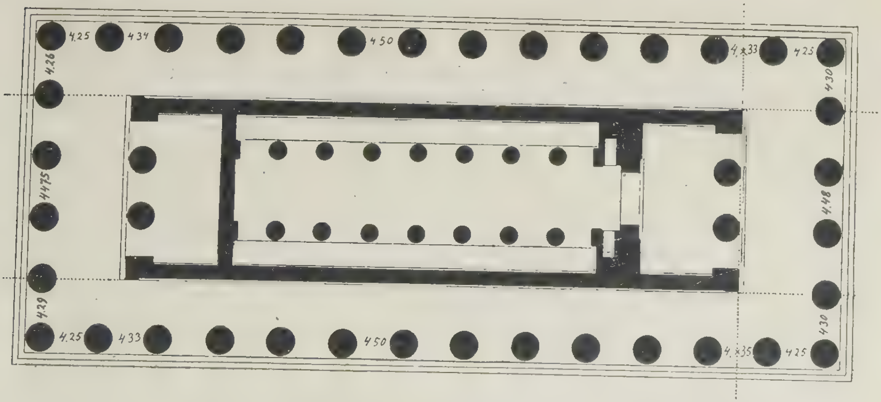

FIGURE 74. PLAN OF THE GREAT TEMPLE AT PÆSTUM.
From R. Koldewey and O. Puchstein's "Die griechischen Tempel in Unteritalien und Sicilien" (1899), Fig. 30.

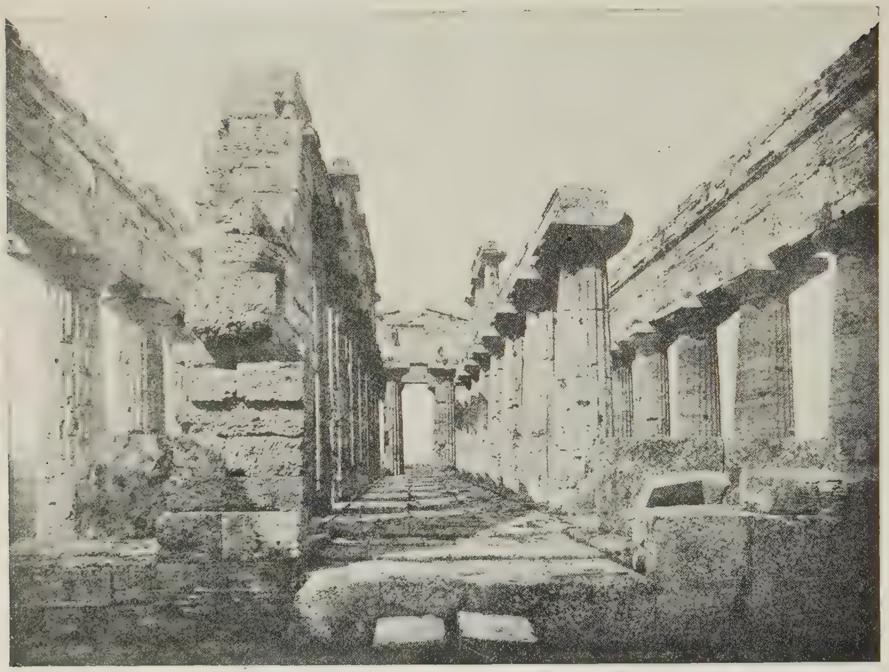

FIGURE 75. THE INTERIOR COLONNADES OF THE GREAT TEMPLE AT PÆSTUM.

Koldewey places the date of the temple as the middle of the fifth century. Most writers hitherto have classed it somewhat carelessly among the archaic temples. Durm still places it in the middle of the sixth century, but in spite of this dating classes it as of the fully developed Doric style. Though its proportions are heavy they are harmonious and have none of the awkwardness and ill-adjustment we have noted in the archaic temples, while such refinements as the curvature of the stylobate and the inward inclination of the columns do not occur in archaic buildings. Clearly the great temple of Pæstum belongs to the period of full development, but the heavy projections, the still somewhat archaic form of the capital, the position of the epistyle over the line of the upper diameter of the shaft, indicate that it was built early in that period. It may be regarded as belonging to the early years of the fifth century, perhaps just before the time of the Persian wars.

It will be seen that the old Temple of Corinth and the great temple at Pæstum were of very nearly the same size. They show also similarities of style and proportion and cannot have been dissimilar in aspect. That of Corinth is in all probability older but perhaps not much more than a decade.

AKRAGAS

Among important temple remains in the West there may be placed next in chronological order, with reasonable likelihood, the colossal Temple of the Olympian Zeus at Akragas in Sicily, one of the most remarkable buildings of Greek antiquity, unique indeed in some of its most conspicuous characteristics, and rivalling in size — in all probability consciously so rivalling — the great temple at Selinus.

Akragas, the ancient acropolis of which is now occupied by the small modern town of Girgenti, — a name which has been softened from the Roman equivalent Agrigentum, — was founded in 582 B.C. by the town of Gela, itself a colony of Rhodes and associated with it in founding this last of the Greek colonies in Sicily. The site of the new colony — destined to become one of the greatest of Greek cities, known throughout antiquity for its luxury and wealth, and among Sicilian towns second only to Syracuse in importance — was placed in the southern coast halfway between Gela and Selinus and seemingly in purposed rivalry with the latter city. It was quite probable this rivalry, often leading to disastrous warfare, induced the men of Akragas to undertake their great temple. The site occupies sharply rising ground between two small rivers which unite just to the south of the ancient city and run together into the sea. The circuit of the walls is still to be traced, enclosing an irregular hilly area over two miles in length and somewhat over a mile in breadth at its widest point, sloping rapidly southward and seaward from the acropolis, until, on the line where the southern wall is placed, the slope pitches rapidly to the plain about a mile from the sea. Within this circuit are the remains of no less than nine temples, all but one belonging to various dates within the fifth century.

The city was taken and destroyed by the Carthaginians in B.C. 405, but the temples perhaps suffered but little in their structure, and the place was recolonized by Timoleon, the liberator of Syracuse from the rule of the tyrants in the year 338. Before the Punic wars, Agrigentum, like most of Sicily, was controlled by the Carthaginians. In 262 it was taken by the Romans, in 214 it again surrendered to the Carthaginians, but came finally under Roman dominion in the year 210 B.C. It shared the fate of the rest of Sicily during Roman rule and during the disintegration of the Roman Empire. The Saracens took it in the year 828 of our era, and like the rest of Sicily it remained under their rule until the Saracen fleet was destroyed by the Pisans and Normans at the battle of Palermo. Girgenti came under Norman rule in 1068 A.D. Some of the temples were converted into churches, and to this owe their partial preservation. From the time of the Carthaginian overthrow at the end of the fifth century before Christ the city gradually shrank until the modern (and mediæval) Girgenti occupies only the site of the ancient acropolis, while the rest of the sloping hillsides within the line of the ancient walls are given over to fields and olive orchards.

The early traditions of the city tell of the building of what was with little doubt the first monumental temple of the colony, the site of it probably covered by the mediæval and modern town. The colony was at first a republic. The popular assembly voted to build a temple to Zeus Policus and intrusted the funds to a wealthy citizen named Phalaris, who was given direction of the work. Phalaris, so the story goes, fortified the acropolis on the plea that the site of the temple must be protected from thieves. He then armed his workmen, attacked the citizens, and made himself tyrant of the city, over which he ruled from 570 to 554 B.C. Of this earliest Agrigentine temple, of which there is record, no vestige has been discovered. Koldewey suggests that it may have stood on the site now occupied by the Cathedral of San Gerlando.

Among the temples of which ruins remain, the oldest is the so-called "Temple of Hercules," which is of the last phase of the archaic period, but has already returned toward the robust proportions which characterize the earliest phase of full development. It is a hexastyle temple of fifteen columns on the side with normal cella, having pronaos and epinaos distyle in antis. The plan is long and narrow and the porticoes in front of pronaos and epinaos have each a depth of two intercolumns. A flight of nine steps extends across the whole front, corresponding to the three plinths of the stereobate on sides and rear. The face of the stylobate is higher than the two remaining plinths. The angle intercolumns were slightly, but insufficiently, diminished and suggest therefore, as Koldewey points out, a timid and partial approach toward the canonical solution of the fully developed style. The intercolumns of the side were substantially of the same size as those of the front. The plan therefore still shows archaic characteristics, yet makes a long step towards the normal type. The shafts were strongly diminished and had marked entasis and twenty-four flutes (Figure 76). The capital has the throat, but only deep enough to form a termination for the channels. The echinus is heavy but of good form. The heavy entablature is almost normal, and is in good proportional relation to the columns. The temple had the high, nearly vertical cymatium along the side, which gives such a broad and over-heavy crowning feature to most of the archaic temples. In spite of some distinctly more archaic characteristics and slightly less heavy proportions, in general aspect as in size the Temple of Hercules at Akragas has much that recalls the Temple of Corinth. The two temples were perhaps not far apart in date, that of Corinth probably somewhat younger, though there is evidence that the mother country was always in advance of the colonies in the development of style. Of the Temple of Hercules but little remains standing. Above its ruin-encumbered platform but a single column lifts itself to the height of as much as three of the four diameters of the shaft.

The colossal Temple of the Olympian Zeus, the scant remains of which adjoin those of the Temple of Hercules close to the southern wall of the ancient city, was probably undertaken a generation later than the Temple of Hercules. It seems to have been begun directly after the great naval victory of Himera, 479 B.C., which freed the Sicilian Greeks

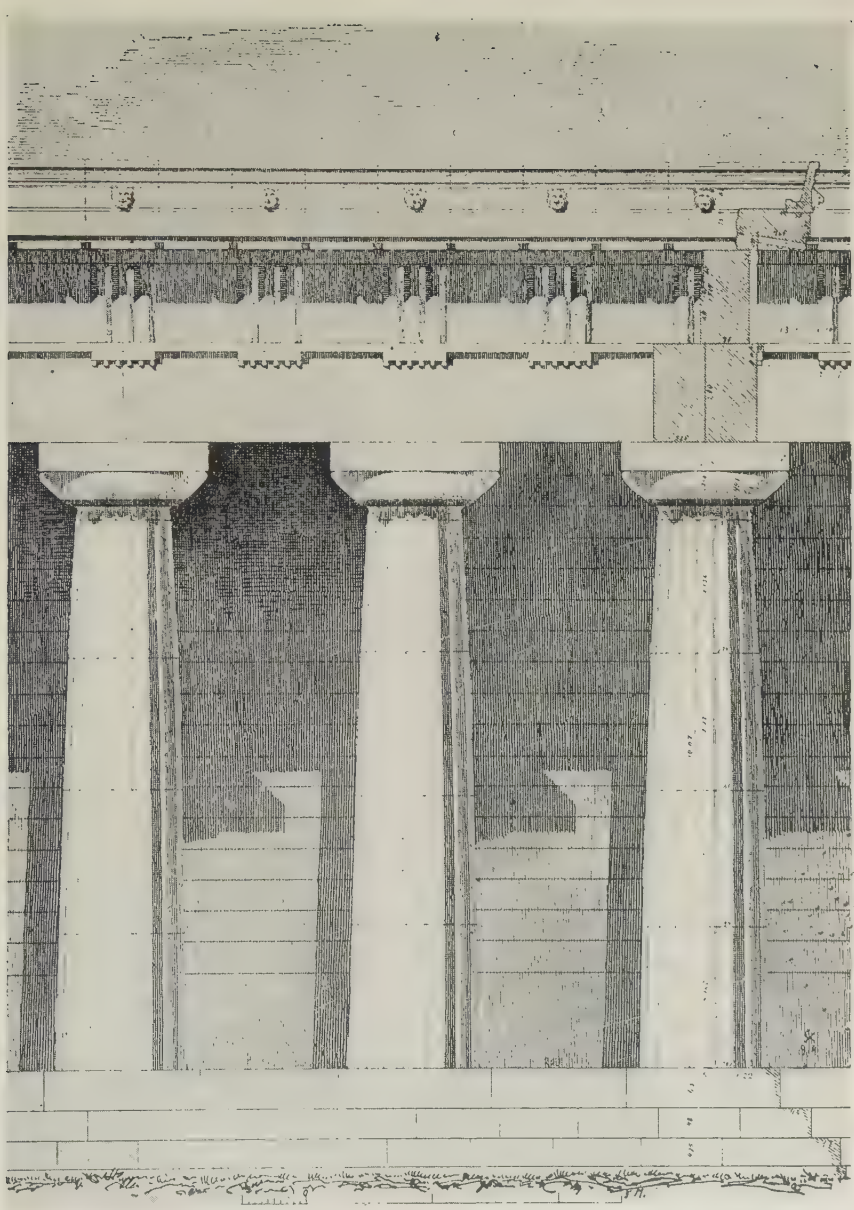

FIGURE 76. SYSTEM OF THE "TEMPLE OF HERCULES" AT AKRAGAS.

From R. Koldewey and O. Puchstein's "Die griechischen Tempel in Unteritalien und Sicilien" (1899), Fig. 132.

from the immediate fear of Carthaginian domination on the very day that the battle of Salamis removed from Greece itself the threat of Persian rule. Carthaginian prisoners were used in carrying on the great work and doubtless Carthaginian spoils helped to furnish the necessary funds. Its building marked the height of the splendor of Akragas. The character of the design more than that of any other Sicilian building illustrates and expresses that love of mere size and of display which marked the Sicilian Greek, and distinguished him from his more refined brother in the mother country with his love of moderation and of delicate beauty.

The huge structure is so exceptional in character as to be difficult to classify. In spite of its date and the skill suggested even by the disintegrated remains of its colossal sculptures, it still shows archaic characteristics. The angle intercolumniations for instance are not diminished, so that in all probability the two metopes flanking either side of the corners were larger than the others. But the peculiarity of the design might well at any date have led to the adoption of the regular spacing. The echinus is abnormally high but not widespreading. Its line is somewhat coarse and heavy, but nevertheless suggests the period of full development and not the earliest point in that period.

Built in conscious rivalry with the great Temple of Apollo at Selinus, which was still under construction when it was begun, the Olympieum of Akragas is of very nearly the same size. In round numbers it measures at the top of the stylobate one hundred seventy-three feet across the front by three hundred fifty feet in length. The stone available at Akragas is less tenacious than that at Selinus and it seems likely that the difficulty of quarrying such colossal lintel stones as would have been required, or the fear lest architraves of such long span would break, led the Akragantine builders to the adoption of the very peculiar and very striking, if illogical, design. The temple was heptastyle with fourteen columns on the side. Its scale therefore is larger than that of the octastyle Temple T at Selinus, although the dimensions across the front are within three feet of being the same in the two cases. It is pseudo-peripteral — an open peristyle did not exist. The huge space was enclosed by a wall against which the massive half-columns were engaged, carrying an entablature which is the crowning feature of the top of the wall. The lower part of the wall between the columns was treated somewhat like the screen-wall of Temple S at Selinus, and on the cornice of this lower part stood human colossi in the intercolumns, their arms folded above their heads, aiding in the bearing of the lower course of the epistyle, which was so cut as to bring a vertical joint over the centre of the intercolumn. These great figures, which perhaps typified the prisoners of the battle of Himera, were, according to Koldewey, set against the upper part of the wall (Figure 77). They are modelled in full relief. They must have been cut in place, since each figure consists of many courses. The striking structural peculiarity of the use in so large a structure of so many stones of moderate and approximately similar size, Koldewey believes was not due wholly to the nature of the stone; but rather in order to make the most advantageous use of the large numbers of unskilled laborers furnished by the prisoners of Himera. The building, he believes, was pushed rapidly to completion and must have been substantially finished by the middle of the century. The half-columns also are built up in numerous courses, each course having four

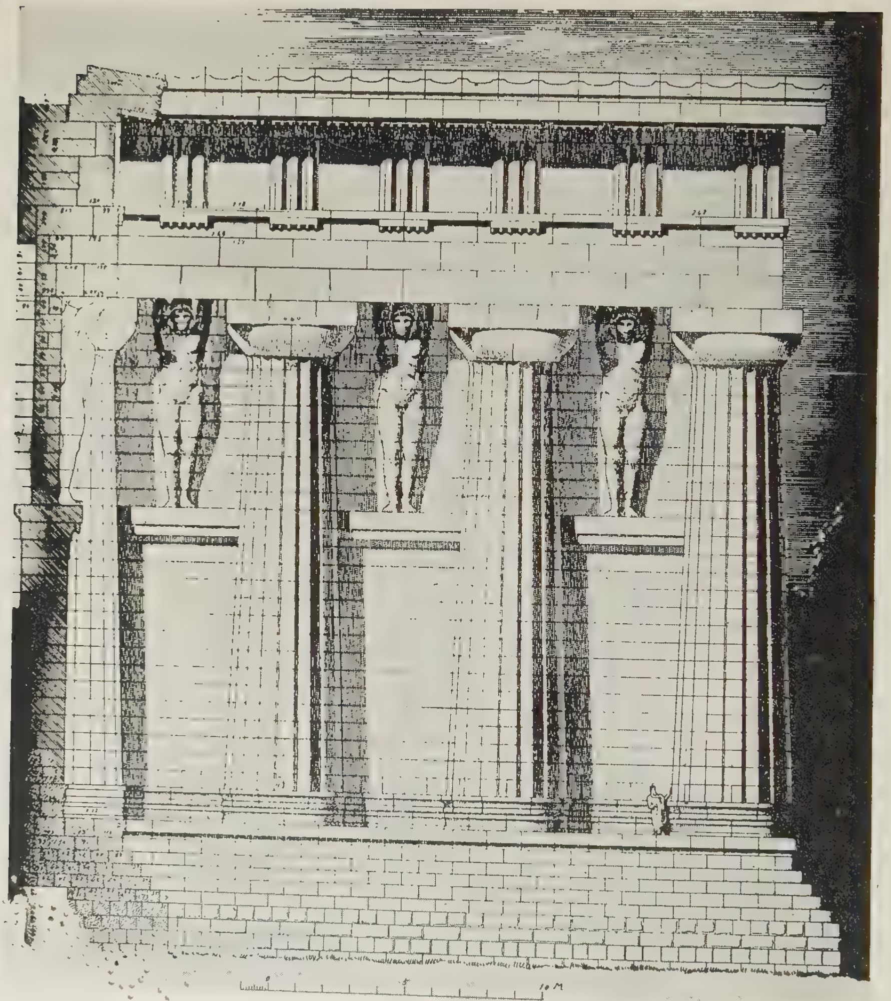

FIGURE 77. SYSTEM OF THE OLYMPIEUM AT AKRAGAS.

From R. Koldewey and O. Puchstein's "Die griechischen Tempel in Unteritalien und Sicilien" (1899), Fig. 143.

or five stones in the half-diameter of the shaft. Each half-echinus was of two stones, and the separate abacus showed three stones in its face. The epistyle had three courses in its height. The metopes were of two blocks, of which the lower was much larger. The biggest stones of the structure were the triglyphs, each of which formed a separate block. As in so many Greek temples the great stones were hoisted into place by ropes secured in U-shaped sinkages in the sides of the blocks (Figure 83).

This apparent colonnade, the largest of Greek antiquity, was therefore nothing but a piece of decorative wall-modelling. It thus anticipates the merely decorative use of the colonnade which was so frequent in Roman architecture. No Greek builder of the mother country at the time would have permitted such a solecism to enter his mind. It would have seemed to him a piece of vulgarity. With him the colonnade was still a structural feature having its true dignity and beauty only when structurally used. But the enormous structure must have been strikingly impressive. It is skilfully and imaginatively composed, and its huge size must have added to its effect. A drawing of Cockerell's showing a Roman soldier standing as in a niche against one of the channels of the shaft gives a realizing sense of the size of these gigantic columns, some fourteen feet nine inches in diameter. Another peculiarity of the design is the boldly but not expressively profiled base, a little over four feet high, which runs about the foot of the shafts and is continued as the base of the screen-wall between them. The whole design is borne upon a stereobate of five plinths surmounted by a low podium crowned by a projecting plinth, this podium serving as the stylobate on which the pseudo-colonnade stands.

The space enclosed by this remarkable exterior wall (Figure 78) Koldewey describes as a great cella divided into three aisles, while most authorities have regarded the central nave as the cella and the side aisles as a sort of pseudo-pteroma. It would be equally consistent to describe the interior as consisting of three parallel cellas. The inner face of the enclosing wall is faced by a series of great pilasters, each corresponding to one of the engaged half-columns of the exterior face. The three subdivisions of the interior are separated by great square piers between which ran screen-walls, the height of which there is no means of knowing. Of the position of the entrances and the method of lighting there is no indication. It seems not impossible that the spaces on each side of the colossi of the outer wall were open, though Koldewey shows them closed. The pediments of the great temple were adorned, as is known from the description of Diodorus, by colossal sculptures representing on the eastern front the battle of the gods and the giants and in the western end the taking of Troy.

The description above given follows the restoration of Koldewey and Puchstein, who have been able to show conclusively from the position in which they found some fragments of one of the colossal figures — the only one of which there were remains still lying where they were thrown by earthquake — that these figures were part of the exterior wall. The fragments were found face down lying between fragments of the fallen half-columns. Before these investigations, the restoration of Cockerell, who had supposed the colossi were used in the upper part of the interior dividing walls, has generally been regarded as authentic or at least probable. The last fragment of the large structure which remained standing is said to have consisted of a fragment supported by the half-columns and by three of the colossal statues. This fragment fell on the 9th of December, 1401. It led to the name "the palace of the giants" given by the people, and to the use of three colossi in the arms of the mediæval town. Both before and since then the ruins had been used as a quarry and in the eighteenth century the mole of the harbor of Porto Empedocle was built of its stones.

Of the other temples of Akragas of which there are still remains all belong to various dates in the fully developed period, probably later than the great temple.

Of these, two are of importance from the beauty of their remains and the degree of preservation in which they have come down to our day. These are the so-called Temples of "Juno Lacinia" and of "Concordia." They are probably not

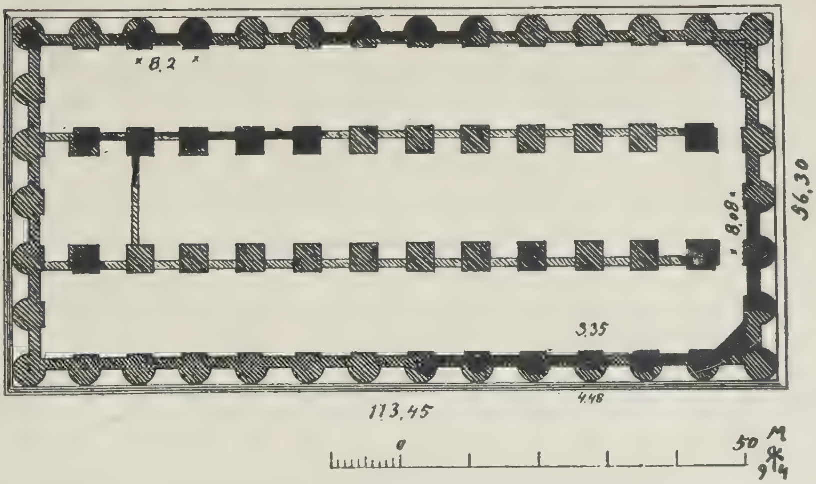

FIGURE 78. PLAN OF THE TEMPLE OF OLYMPIAN ZEUS AT AKRAGAS.

From R. Koldewey and O. Puchstein's "Die griechischen Tempel in Unteritalien und Sicilien" (1899), Fig. 136.

far from each other in point of date and may well be, as Koldewey suggests, the one a little earlier, the other a little later than the Parthenon.

The Temple of Juno (Figure 79) is clearly somewhat the earlier of the two. It is also the less well-preserved. Its interesting ruins occupy a prominent site on the extreme southern point of the walls just where the cliff on which they stood makes a sharp right-angle turn from a direction nearly east and west to nearly north and south. It is an imposing situation. The temple is small; the top of the stylobate measures about fifty-five and a half feet across the front by about one hundred and twenty-five feet in length. Except on the front and a part of one side, the building rests on a plain podium of four courses in height, this arrangement resulting from the irregularity of the site. It is probable that this podium was always exposed to view. Above this is a stereobate of four plinths. Across the whole of the east front there ran a flight of steps; there were nine risers. The four lower steps alone remain in large part in place. The temple was hexastyle with thirteen columns on the side. Thirty of these columns, besides those of the pronaos and epinaos, remain standing — including all those of the north side, which still carry their epistyle — and in one place a small piece of the frieze. The rest of the entablature has been overthrown but many of the blocks remain on the site. Of the geison unfortunately no fragment has been found. The plan and the design as a whole is in most respects normal; but the corner columns are of the same diameter as the others, and there is no appreciable diminution of the angle intercolumns. Taken together with the character of the order, which clearly indicates an advanced date, we have here again

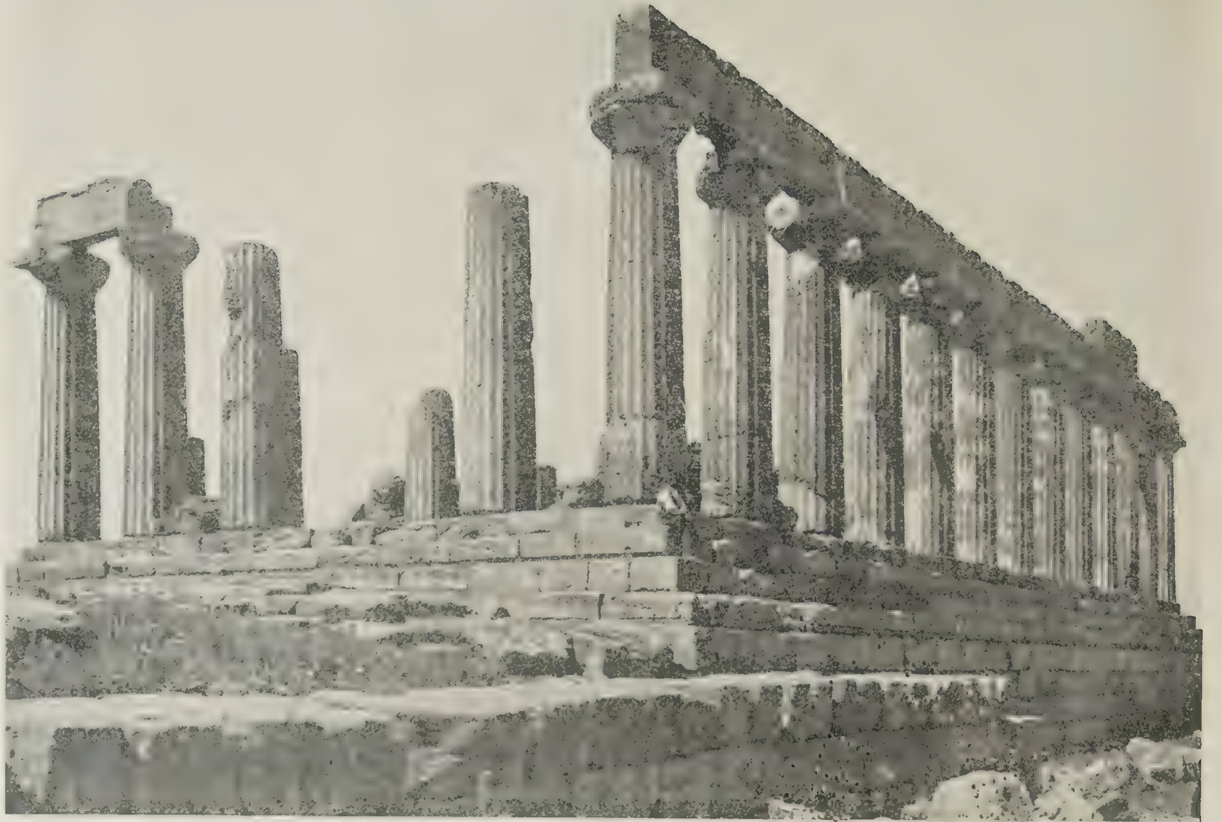

FIGURE 79. THE "TEMPLE OF JUNO LACINIA" AT AKRAGAS.

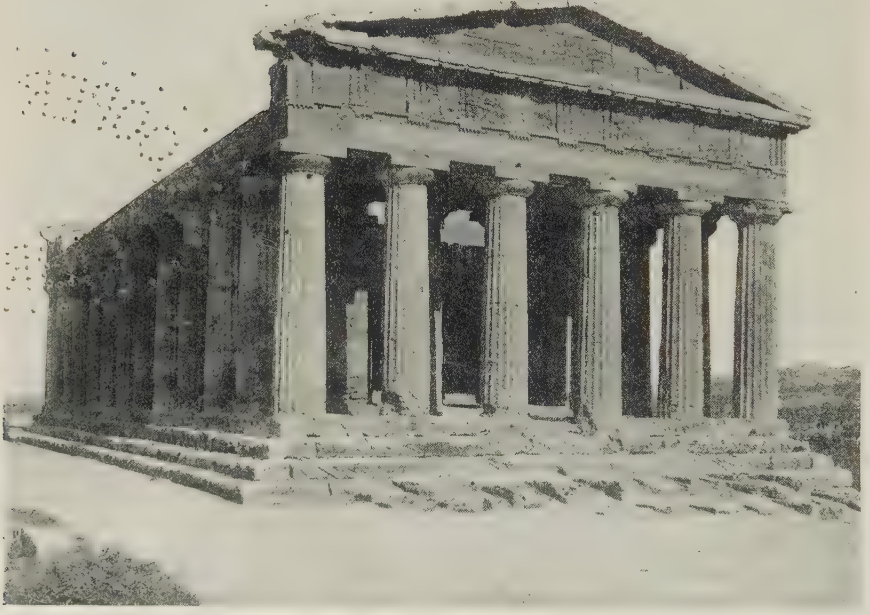

FIGURE 80. THE "TEMPLE OF CONCORD" AT AKRAGAS.

evidence that the colonies lagged somewhat behind the mother country, especially in point of refinement. The pteroma is narrow; the east and west porticoes slightly deeper than those of the side. The capital is divided from the shaft by three incisions. The necking partakes to an unusual degree of the curve of the echinus, which is of good form, but somewhat widespreading. The line of the epistyle is placed beyond the line of the upper diameter of the shaft. The columns are hardly more than four and a half lower diameters in height.

In front of the Temple of Juno are the remains of its altar, nearly as long as the temple façade and running parallel with it. Characteristically, the altar is a narrow structure approached from the side toward the temple by a flight of steps running its whole length.

The so-called Temple of Concord (Figure 80) is also situated close to the southern line of the city wall, and about halfway between the Temple of Juno and the Temple of Hercules. About the year 597 A.D. it was transferred by Bishop Gregory II of Girgenti for use as a church and was dedicated to Saints Peter and Paul. To this circumstance it is due that it is one of the best preserved of ancient temples. Its cella wall was then pierced with arches, its outer colonnades were walled in, so that the nave and side-aisles of a mediæval church were thus formed. It is of about the same size as the Temple of Juno and almost identical in scheme of plan. Its columns were all of the same diameter, but the two intercolumns on each side of each angle are diminished so as to gradually adjust the intercolumniation to the triglyph frieze. The lower diameter of the columns of the peristyle is the same as in the Temple of Juno, but the columns are slightly over four and three quarters of a lower diameter in height. The diminution of the shaft is slight, and there is a delicate entasis. The capital has a single incision below the necking and the echinus is not quite so widespreading as that of the Juno temple. As in most of the Sicilian temples the ceiling of the pteroma was formed of wooden beams, doubtless protected as in other instances by terra cotta. The position of these beams is clearly indicated by the sockets to receive them. The staircases leading from either side of the entrance door to the roof-space are partly preserved.

All of these temples were covered with stucco and decorated with color. A certain coarseness of detail in the friable shell limestone is doubtless partly owing to the fact that the final finish, the delicacy of profiling, was reserved for the stucco covering, which though in most places a mere thin coating, was yet sufficient to take the last refinement of the detail.

Somewhat to the westward of the Olympieum there now stand four Doric columns carrying an entablature and the corner of a pediment (Figure 81). They are commonly spoken of, but without good reason, as the Temple of Castor and Pollux. The fragments of which the ruin is built are not in their original relations and were set up here by the Sicilian Commissioners of Antiquities — three columns in 1836, the fourth in 1871. They are set up on modern foundations, but near the site are the foundations of two temples to one or both of which the fragments belonged. Apart from the picturesqueness of the group, it is chiefly of interest because of the stucco covering which still largely adheres to both columns and entablature. The traces of color have disappeared. The construction of the frieze is noteworthy. It consists of two horizontal courses, each block of which includes the lower or upper part of one metope and one adjoining triglyph. It may be questioned whether the heavy and awkward cymatium ever formed part of the building to which the other fragments once belonged.

Although the site of the ancient city is now a waste of field, pasture, and olive grove, as we view it from a distance the traces of the ancient circuit of the walls, the awe-inspiring remains of so many temples, the striking picturesqueness of situation and — apart from the small mediæval town which crowns the distant acropolis — the very absence of later works of man, tempt one to restore in imagination the great city which once stood here: its narrow streets of crowded

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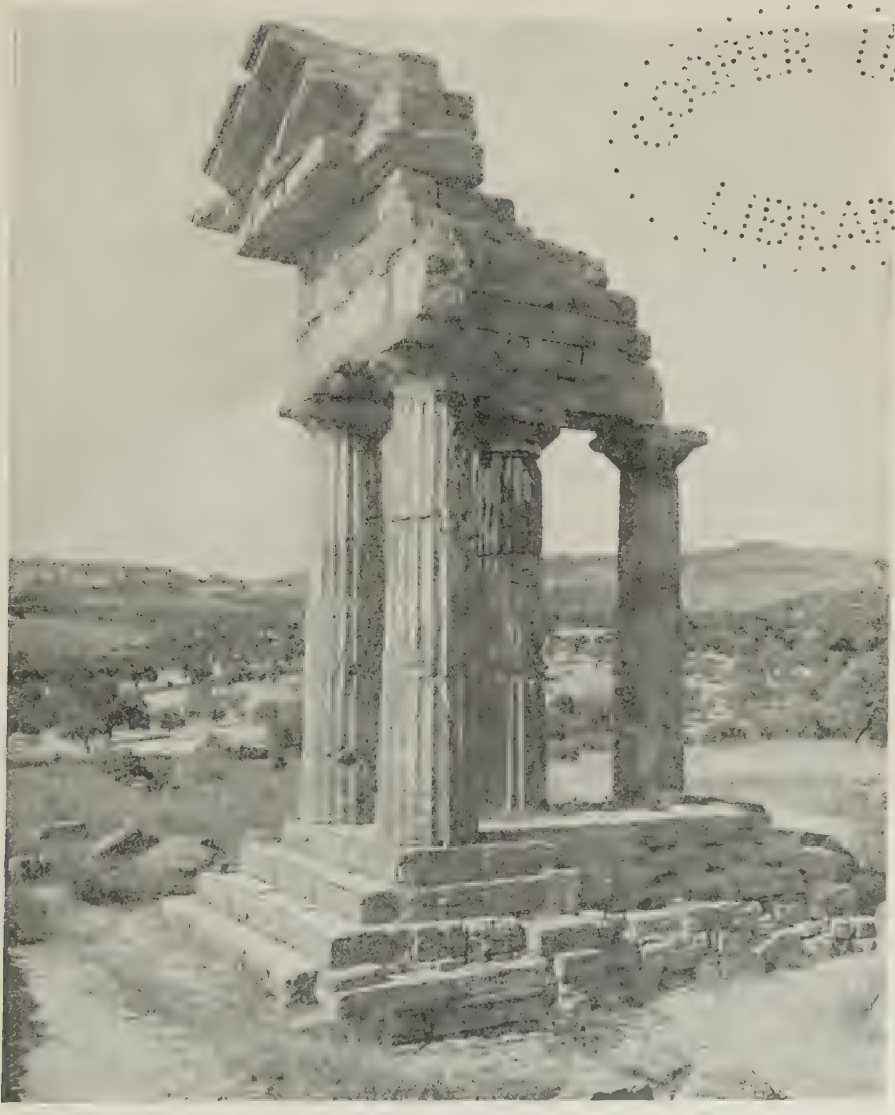

FIGURE 81. THE "TEMPLE OF CASTOR AND POLLUX" AT AKRAGAS.

stucco-covered houses, for the most part devoid of marked architectural character; its great market-places flanked irregularly by colonnades; its richer houses with their open courts, at the farther end of which would be found the porticoes of the megarons; its gardens; its temple-crowned acropolis; and, conspicuous along the circuit of its walls crowning the cliff, the temples, whose scant remains we have been examining,—the colossal face of that of Olympian Zeus towering high above its neighbors. Outside the walls must have been villas half hidden in groves and gardens, and the bustling traffic of a great port passing from the harbor along the roads to the city gates, whose position is still easily traced. At the port itself more houses and warehouses, arsenals and temples, with all the activities of the harbor of a great commercial centre, backed by the forest of masts of the ships with their square sails and banks of oars.

SEGESTA

One other Sicilian temple is of an importance which demands consideration because of the almost complete preservation of its peristyle and because, having never been quite finished, it sheds further light on the technical processes of Greek building. This is the temple of Segesta on the northern coast of Sicily. The interesting ruin stands absolutely alone in the midst of hills, a witness to the complete Hellenization of a barbarian city. The character of its architecture indicates that in date it cannot have been far from the Temple of Juno at Akragas. It was a hexastyle building with fourteen columns on the side, and consists now of the encircling colonnade carrying the complete entablature and the pediments at either end (Figure 82). Of the cella walls, of pronaos or epinaos, or of interior floor there is now not a vestige visible. Within the colonnade and beyond the column foundations is a level stretch of greensward.

Quite inaccurately some writers have assumed that this is all that was built, that the temple was begun with the colonnade and proceeded no further! So illogical and difficult a mode of building was, of course, never adopted. The old buildings, when they came to be used as quarries, lost first of all the squared stones of their cella walls, which were most available for new structures and naturally first attracted the despoilers. The same method of quarrying in old buildings is to be seen, for instance, in the case of the temples of

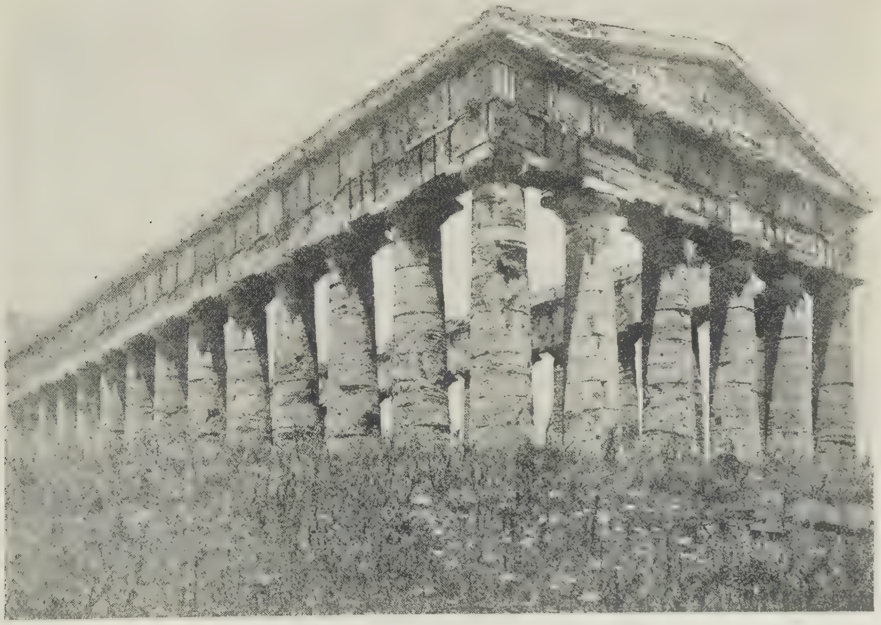

FIGURE 82. THE TEMPLE AT SEGESTA.

Pæstum ; but there, especially in the case of the great temple, the destruction has not gone so far. This explains why in most cases there is more of the colonnade remaining than of any other part of the building. The peculiarity in the case of this solitary monument of ancient Segesta is that the removal of the walls and floors has been so complete, even the easily removable blocks of the stylobate between the columns having been taken, and that in spite of this weakening the entire colonnade has escaped the destroying earthquake. The columns as they stand now are unfluted, the face of the shaft being beyond the line indicated by the necking of the capital. This is not the only instance, but it is the clearest and most complete example of unfinished work, which shows that the Greeks completed the structure of their temples entirely, including undoubtedly the roof, before undertaking the finished cutting of the stone. This was done in order to avoid injury to delicate details, while the building was still in process, whether by the accidental falling of tools or material, or other accident. This method accomplished the same purpose which in modern times is generally met by boxing in the parts liable to injury. For the same reason a projection was left on the corners of the abaci. The floor and the stylobate were not brought to their final surface ; the bosses used in hoisting the stones into place were left to be removed by the final cutting (Figure 83). All this is to be seen in the Temple of Segesta. The process was : to complete the building in the rough and then, after it was roofed in, to start at the top and working gradually downward to complete the final cutting of the more delicate parts, including the flutes with their sharp arrises, which would be particularly liable to injury. The Temple of Segesta never got beyond this stage of rough completion. The building is of excellent design and shows a number of refinements. All the lines of the stylobate have a convex curvature, amounting in the south side, according to Koldewey, to slightly over three inches (8 cm.), and on the east side to half that above the horizontal.

We have now to turn to Greece itself, where two buildings especially claim attention before we take up the culmination in Attica.

ÆGINA

From the early years of the fifth century comes the important little temple in the island of Ægina, off the coast of Attica. Small as the island is (it has a circumference of twenty-two and a half miles), it seems in early times to have been divided among several practically independent town states; but Ægina, the most important, presently controlled the whole island. At one time it was a dependency of Epidaurus, later, about 748 B.C., of Argos. Soon, however, it became strong enough to assert entire independence. As an island state it early turned for a livelihood to the sea and to commerce — in those primitive times associated at first with piracy as occasion offered. It was among the earliest of Greek states to coin money, a convenience which Ionian cities of Asia Minor had derived from Lydia in the seventh century. Its merchants were among the most enterprising of Greece, and dealt in produce and wares of all kinds. Its intercourse with Egypt was frequent. In 563 B.C. it was permitted by Amosis to build at Naucratis, on the site of Alexandria, a temple of Zeus Panhellenius. Situated in full sight of Athens Ægina excited the hatred of the jealous Athenians, whose power the Æginetans for a long time rivalled, whom indeed in commercial development they preceded. The importance of Ægina at the time of the Persian wars is shown by this contribution of thirty sail to the united Greek fleet at the battle of Salamis, although they had to retain a larger number of ships to defend their own coasts. In spite of Ægina's efficient aid against the Persians Athenian rivalry increased with Athenian power, and Themistocles found it necessary to fit out no less a fleet than two hundred triremes against the Æginetans, who lost as many as seventy vessels in a single engagement. They were finally defeated by Athens in a naval engagement in 460 B.C. and four years later the city of Ægina surrendered. The Æginetans rebelled, however, and in the first year of the Peloponnesian War the Athenians expelled the whole population and cut off the right thumbs of all the males so that they should not again bear arms against the Athenians, a revolting ruthlessness which was only partially avenged when after the defeat of Athens by Sparta at the battle of Ægospotami the power of Athens was destroyed. The Spartans under Lysander expelled the Athenian colonists who had been settled on Ægina, collected the scattered Æginetans as far as possible and reëstablished them in the possession of their island. But the greatness of Ægina had departed.

The ruins of the temple still form a most picturesque object of a dominating plateau in the centre of the island. Though the building was small, no more beautiful or more exquisitely decorated temple had up to that time been built in Greek lands. Both its architectural form and its sculpture seem to have surpassed in beauty and refinement anything to be found elsewhere at the same date. At one time supposed to be a temple of Zeus Panhellenius, it has until recently generally been regarded, on account of the dominating figure of the goddess in the pedimental sculptures, as a temple of Athena. The German excavation, however, which lately revealed all the buildings of the temple precinct, brought to light several inscriptions indicating a dedication to the little-known goddess Aphæa, identified with Britomartis, a companion of Artemis. The building seems to belong to the period just before or early in the Persian wars. It was not in or very near any town or city but was an isolated shrine remote from other buildings except those of its own sacred precinct, which included the dwellings of the temple attendants and other such adjuncts. From earliest times the spot seems to have been regarded as sacred, and the buildings that followed one another on the site epitomize some of the steps in the development of the Greek temple. In the Achæan period there was but an altar and a grove. Later, probably in early Dorian times, a small megaron with its preceding portico was built. Still later a somewhat larger structure with a portico distyle in antis and two rear chambers took its place, and this in turn, destroyed apparently by fire, gave room to the temple of the early part of the fifth century whose picturesque ruins still dominate the southern end of the island.

The temple is a hexastyle peripteral building with twelve columns on the side, of the pure Doric style, having the normal type of plan of the fully developed period with interior colonnades, as at Pæstum, of two superposed orders. A portion only of the peristyle with some of the architrave blocks remains standing, showing the U-shaped sinkages at the end used in hoisting (Figure 83); but the fragments found on the site, which include some of the capitals of both the interior

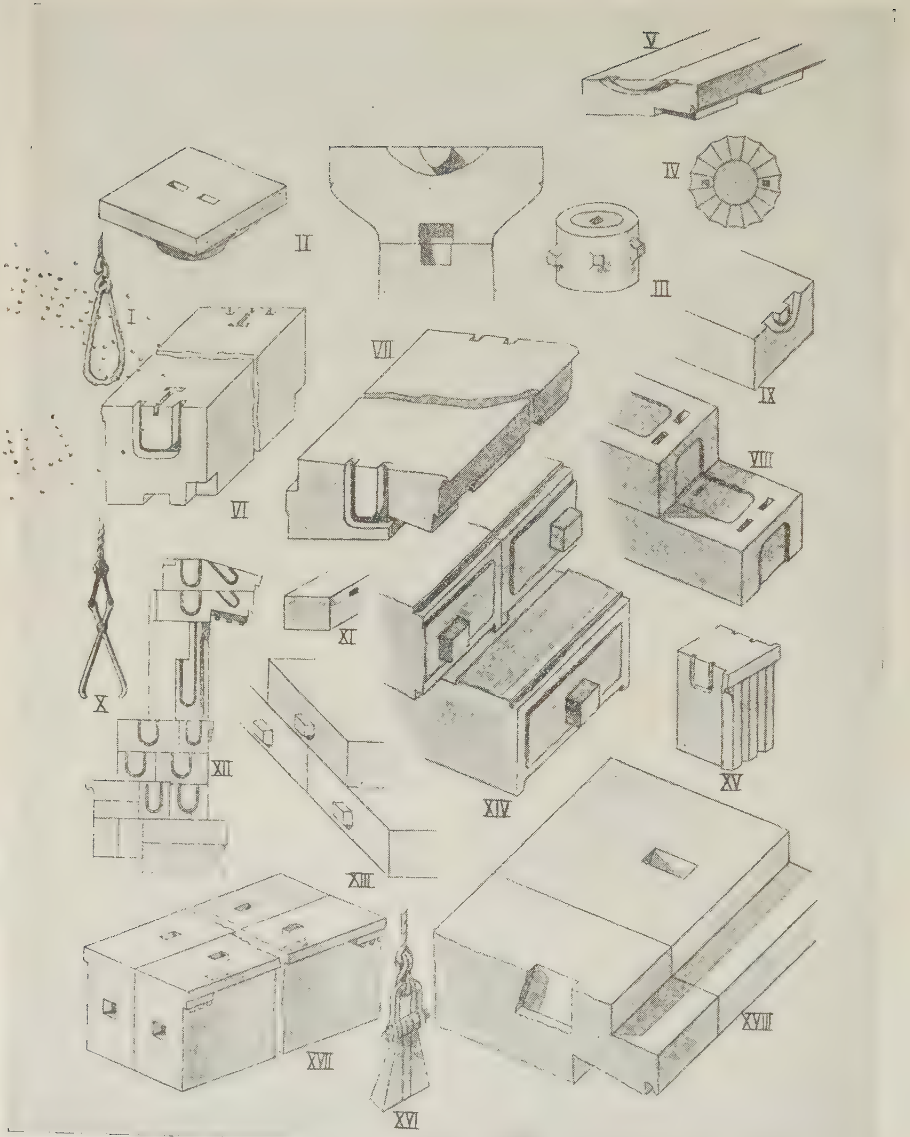

FIGURE 83. METHODS EMPLOYED IN THE ERECTION OF GREEK BUILDINGS.

From G. Perrot and C. Chipiez' "Histoire de l'art," Vol. 7 (1898), Pl 52.

II, VI, VII, Ægina.
III, XIII, Athens.
IV, Lesbos.
V, VIII, IX, Olympia.
XII, XV, Akragas.
XIV, Segesta.
XVII, XVIII, Selinus

orders, make a complete restoration possible. Its rear chamber seems to have been due to a change in scheme, while the building was in process. The temple measures but forty feet across the front. Its architectural forms show all the characteristics of the normal style of the great period. The echinus of its capitals has great refinement of line, but is still somewhat widespreading, especially in the interior. The peristyle columns are inclined slightly inward, they are but little diminished, with a delicate entasis. The face of the architrave overhangs the line of the upper diameter. On the architraves of the pronaos and of the interior orders the regulæ and guttæ are used in spite of the non-existence at these points of a triglyph frieze. The greater part of the structure is of porous limestone which was covered with stucco and decorated with color, of which many remains were found. The sculpture, however, and the roof-tiles were of Pentelic marble. The building is chiefly remarkable for its beautiful pedimental sculptures, whose figures, about life size, show perfect command of the human form but faces still of decidedly archaic character. These groups, representing the siege of Troy, are now preserved in the Glyptothek Museum in Munich, where they are set up as restored by the Danish sculptor Thorwaldsen. In this form they are familiar through the casts to be found in most of our museums. Unfortunately this restoration was in many respects inaccurate, as was shown especially by the careful studies of Furtwängler, whose models (Figure 84) show the original arrangement. Important portions of the marble griffin figures that formed the angle ornaments of the pediment and of the marble acroterium with its delicate scroll work and human figures are also preserved. The building, one of the most charming of Greek

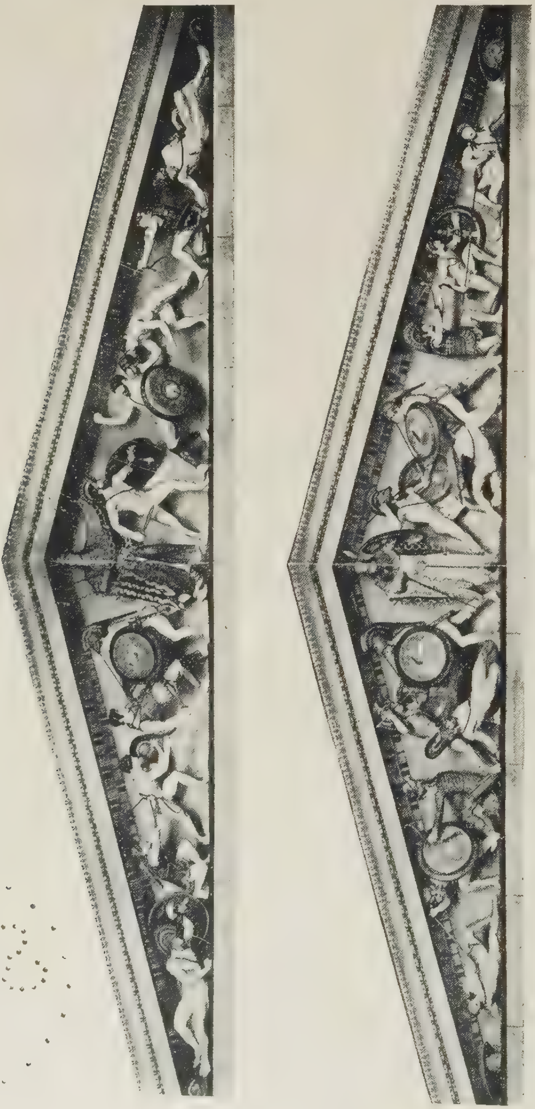

FIGURE 84. THE EASTERN AND WESTERN PEDIMENTS OF THE TEMPLE AT ÆGINA, RESTORED.

From A. Furtwängler's "Masterpieces of Greek and Roman Sculpture" (1914).

monuments, was greatly enhanced in effect by its situation. The placing of the temple and the arrangement of the precinct shows that picturesque and accidental character of grouping which is characteristic of Greek planning.

OLYMPIA

This irregular picturesqueness is also strikingly shown in the great group of the Altis of Olympia already spoken of, of which the Temple of the Olympian Zeus is the dominant central object (Figure 85). The Greek temples are symmetrical in design, but minor buildings are often unsymmetrical and the juxtaposition invariably shows picturesque irregularity of grouping. Greek design is by no means unsensitive to general effect, but takes advantage of irregularities of site and makes no attempt to avoid the accidents of juxtaposition due to successive epochs of building. Indeed the grouping of Greek buildings in their relation to each other shows no more self-conscious composition than is to be found in the courtyard of a Mycenæan palace.

In spite of its later date (it was begun in 468 and completed 456 B.C.) the much larger Temple of Zeus at Olympia — also hexastyle but having thirteen side columns, and measuring ninety-one feet across the front — is less refined in design than the Temple of Ægina. The capital is somewhat heavy, the line of the echinus not unlike that of Ægina, but much less refined. It has four annulets and three incisions below the necking. The columns, strongly diminished, show irregularities of diameter, the extreme variation being over an inch and a half (5 cm.). The general character is that of the period of full development. The building of lime tufa was covered with stucco; but the sculpture and the roof tiles, as at Ægina, were of marble. An interesting minor feature of the ruins in their present condition, since the German excavations, is the remains of a rich mosaic pavement in the epinaos.

Pausanias has given a very full and complete account of the building as he saw it, with the gilded vases occupying the angle of the pediment, the apex of which had as acroterium a gilded Victory. The pediments were occupied by sculptured figures of splendid style and monumental scale, showing a distinct advance beyond those of Ægina, especially in the treatment of the faces. These groups, Pausanias tells us, were, in the east pediment, by the sculptor of the Victory, Pæonius of Mende; in the west pediment by Alkamenes, the contemporary of Phidias, regarded as second only to him in skill. These ascriptions have recently been questioned on account of the supposed difference of style as compared with the great Victory of Pæonius, and the relatively archaic character as compared with the only slightly later sculptures of the Parthenon. Greek art has, however, hardly produced a nobler figure than the central figure of the western pedimental group, which represents the struggle of the Centaurs and the Lapithæ. It is hardly inferior in execution to those of the Parthenon and in conception is in some respects superior. The restraint and breadth of handling, the monumental conception, make these figures even more perfectly adapted to their position, to their function as architectural decoration, than the more completely realized and more exquisitely finished pedimental figures of the Parthenon itself. The exterior entablature had no sculpture in the metopes. The entablature over the pronaos columns had the customary form of Doric triglyph frieze, and the metopes were here filled with sculpture. Pausanias describes also the bronze

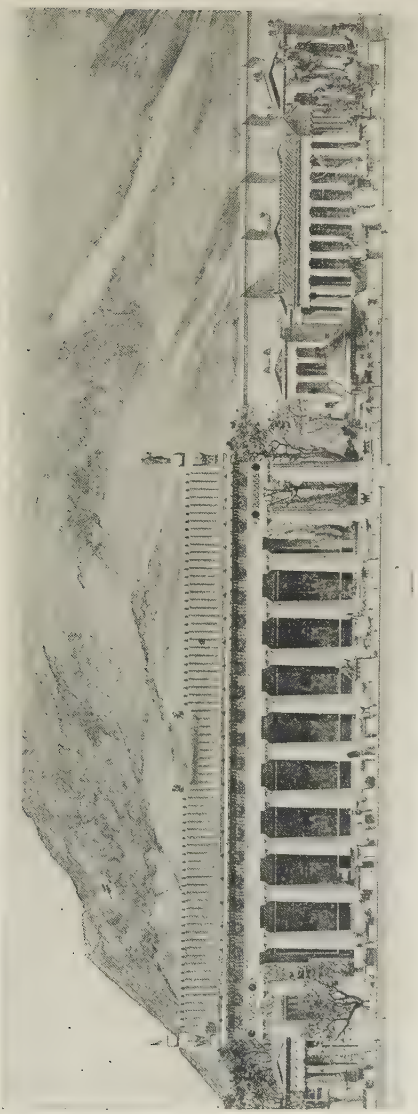

FIGURE 85. THE TEMPLES AND TREASURIES OF OLYMPIA.

From V. Laloux's "Olympie" (1889).

doors, the two rows of interior columns in two stories and the staircase leading to the roof-space. The architect of the building, so he tells us, was Libon of Elis.

The splendid group of Olympia was not completed even with the building of this, its largest and central temple. Other temples, shrines, halls, gymnasia continued to be added; even the Romans made important, if somewhat incongruous, additions. Set as they were in the midst of trees and shrubs — the "grove," *altis* — the buildings, colonnades, and statues must have produced an ensemble of striking picturesqueness and beauty.

THE IONIC STYLE AND THE IONIC ORDER

In order to study the culminating development in Attica we have first to trace the early growth and development of the Ionic style which there joined with the Doric to produce it.

The Ionic style apparently had its origin on that Ionian shore of Asia Minor which formed the eastern outpost of the Hellenic peoples. It owes its distinctive character largely to the strong oriental influences, coming from the eastern hinterland, which were the inevitable atmosphere of its situation. The forms, however, were influenced also by the physical character of the country, the rich luxuriance of which seems reflected in the architecture. The hills, in those days clad with mighty forests, furnished timber, while they also gave abundance of the best building stones. In structure and plan-forms the style partook of the same common Greek character which has been noted in connection with the Doric style. The plan, the megaron type, is practically identical, and passed through the same stages of development, in the two branches of the Greek style. Both make use of the columnar construction and of the gable-roof and pediment, and in the same way. In these fundamental respects the Ionic style shows its essentially Greek character, which belongs to it by racial inheritance.

In decorative treatment, however, it partakes of that oriental tinge which belongs to it by virtue of geographical position. From the decorative point of view, merely, it might be regarded as belonging to that Near Eastern group to which Lycian, Carian, Lydian, Syrian, Hittite, and Phœnician art also belonged, and of which the Assyrian and later the Persian art are the most characteristic expressions. In common with these oriental styles it has in its beginnings a certain barbaric richness which differentiates it strikingly from the more restrained, more logical, and more structural Doric. This character is gradually modified and refined, especially under the influence of Attica. While the style is apparently mainly of Ionian growth, archaic remains in Attica itself seem to point to the fact that Attica also shared in its early development. Indeed, there is reason to believe that the earliest forms in Attica were Ionic and that the Doric traditions came in somewhat later, the two gradually commingling. The development is well summed up by Durm[1] when he says: "The oldest record of the lands of Asia Minor and its adjoining islands stretches back to about the middle of the second millennium before Christ. The first, doubtless very simple, products of the art of building are probably native to the soil. The later structures, through Phœnician, Assyrian, and Egyptian influence, come to richer growth and receive through the addition of the Greek element a higher perfection of form. Transplanted to European soil the treatment of the detail reaches in the Hellenic mother country (in Attica) the highest stage of perfection and refinement."

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[1] *Baukunst der Griechen* (1910), p. 292.

The most striking and distinguishing characteristics of the Ionic order (Figure 86), as compared with the Doric, are, apart from its more slender proportions, the use of the scroll or volute in the capital, inserted between the narrow echinus and the still narrower abacus; the existence of a distinct base to each column; the subdivision of the epistyle; the absence of triglyphs in the frieze; the more elaborate cornice, the bed mouldings of which in the pure Ionic include the distinctive feature of dentils. As will be more fully pointed out later, the Ionic order expresses the ideas of the post and lintel construction of stone hardly less logically than the Doric; but it does so as it were in more numerous words, more elaborate phrases. It is the loquacious and graceful Ionian who is speaking, using his ornate poetry, not the sterner, the more reserved, the less gracious Dorian with his Laconic mode of expression. It says the same things, but it does so in more elaborate fashion. There are the same differences in the literature of the two branches of the Greek peoples. The two architectures are the outgiving of racial character.

If as to the origin and significance of the earliest Doric forms there is room for doubt, there is hardly any question as to the beginnings of the Ionic order. Its forms are very clearly of what we have called the secondary character. To a late date they strongly recall their origin in the imitation of forms essentially those of wood decorated with metal. The earliest Ionic columns of which remains have been found, in striking contrast to the early Doric supports, are very tall

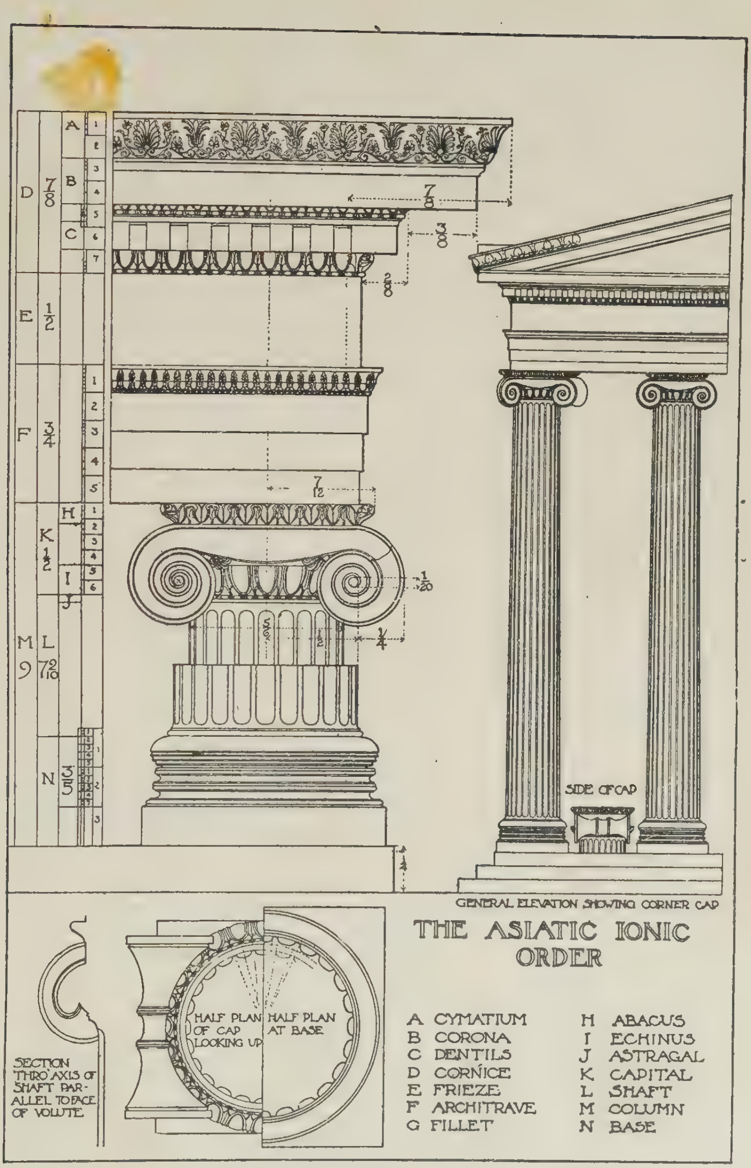

FIGURE 86. NORMAL FORMS OF THE GREEK IONIC ORDER.

From a drawing prepared under the direction of the author.

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and slender,[1] so slender as to appear, — like the somewhat similar but larger Persian columns of later date, — out of keeping with their material. The early construction of the Near East seems, subsequent to the Mycenæan epoch, to have consisted of walls of stone — of rubble, or often of squared stones, sometimes in large blocks — with door-enframements, supports, and roof-construction of wood. Some of these early forms are reflected in later Lycian and Carian rock-cut tombs, as at Antiphellus (Figure 87), Telmessus, and Limyra.

The temple and the palaces of Solomon in Jerusalem, built about 950 B.C., belonging as they do to the same Near Eastern group, cast an important sidelight on the early construction out of which grew the Ionic style. In decorative character they are richer, more ornate, than any Greek work, and are Phœnician, not Greek, in style. The Hebrew was in the fine arts never an originator, but a borrower — and at this epoch even more than his Phœnician relative — from Egyptian, Assyrian, and Phœnician sources. The construction described shows the use of the same materials, employed in much the same way as throughout Asia Minor, and indicates the extent to which the Phœnicians as carriers of Egyptian and Mesopotamian influences may have contributed to early Ionic forms. It would probably be truer, however, to say that primitive Ionian, Syrian, and Lycian architecture belong to the same general group as the Phœnician, and so partook of certain common characteristics. The verses in the First Book of Kings[2] which make clear the nature of this construction, may be cited. They are here quoted, not in the sequence of the text, but in such order as will most clearly indicate the successive steps and the character of the construction. As we are here concerned with the structural materials, forms, and character only, and not with the forms of plan, the lines are quoted without regard to whether they relate to the temple, to the house of the King or of the Queen, or to the so-called "House of the Forest of Lebanon."

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[1] Durm, *op. cit.*, suggests that the Doric proportions are due to the derivation of the first use of the stone column from Egypt while the slender Ionic shaft similarly marks the influence of Asia.

[2] 1 Kings, Chs. v, vi, vii.

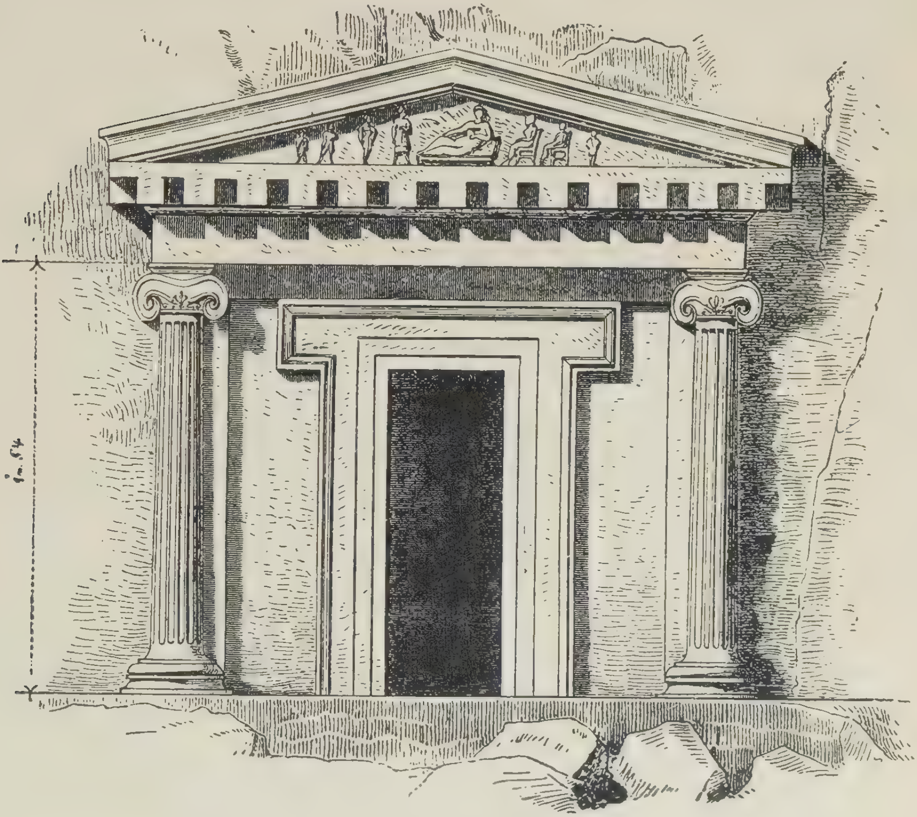

FIGURE 87. TOMB AT ANTIPHELLUS IN LYCIA.
From J. Durm's "Baukunst der Griechen" (1910), Fig. 261.

"And Solomon sent to Hiram King of Tyre, saying, Now therefore command thou that they hew me cedar trees out of Lebanon, and unto thee will I give hire for thy servants, for thou knowest that there is not among us any that hath skill to hew timber like unto the Sidonians. And Hiram sent to Solomon, saying, I will do all thy desire concerning timber of cedar and concerning timber of fir. My servants shall bring them down from Lebanon unto the sea, and I will convey them by sea in floats unto the place which thou shalt appoint. And the King commanded, and they brought great stones, costly stones, and hewed stones, to lay the foundation of the house, and Solomon's builders and Hiram's builders and the stone-squarers did hew them. All these were of costly stones, according to the measures of hewed stones, sawed with saws within and without even from the foundation unto the coping. And the foundation was of costly stones, even great stones, stones of ten cubits and stones of eight cubits." Such stones may be seen in the temple foundations at Jerusalem, while in the temple terrace at Baalbek, a Phœnician structure which far antedates the Roman work that rests upon it, there are carefully squared stones over sixty feet in length and thirteen feet in the height of the course — a stone still remaining in the quarry is nearly seventy feet in length. "And he built the walls of the house within with boards of cedar, both the floor of the house, and the walls of the ceiling: and he covered them on the inside with wood, and covered the floor of the house with planks of fir. And the cedar of the house within was carved with knops and open flowers: all was cedar; there was no stone seen. And the whole house (within) he overlaid with gold. And he carved all the walls of the house round about with carved figures of cherubim and palm trees and open flowers, within and without. He built also the House of the Forest of Lebanon upon four rows of cedar pillars with cedar beams upon the pillars, and it was covered with cedar above upon the beams, that rested on forty-five pillars, fifteen in a row." All this was carried out, as in Egypt, by the use of forced labor for the unskilled portion of the work, as when Solomon sent laborers to assist the workmen of King Hiram: "And the King raised a levy out of Israel and the levy was thirty thousand men, and he sent them to Lebanon ten thousand a month by courses, a month they were in Lebanon and two months at home."

Of the same general character must have been the primitive Ionic construction. In the course of time through wasteful use of the abundant forests for the building of towns and fleets, for export and for fuel, the supply of timber became less, and at the same time through increasing luxury and civilization the desire for more permanent and monumental structures grew — conditions which we have seen in America affecting the development of architecture. Columns of stone were then used in place of wood. By this time, however, the types of form used by the Ionians had become so fixed that the wooden columnar system was reproduced, at first almost slavishly copied, in stone. The conditions were quite different from those which accompanied the origin of the Doric style, when after the Dorian invasions and the destruction of the Achæan civilization and art, the use of stone was introduced, apparently, before the forms of any wooden architecture which the Dorians may have used had time to develop and become fixed.

One of the earliest examples of the use of such transitional, or as they might be called proto-Ionic, columns of stone, is in

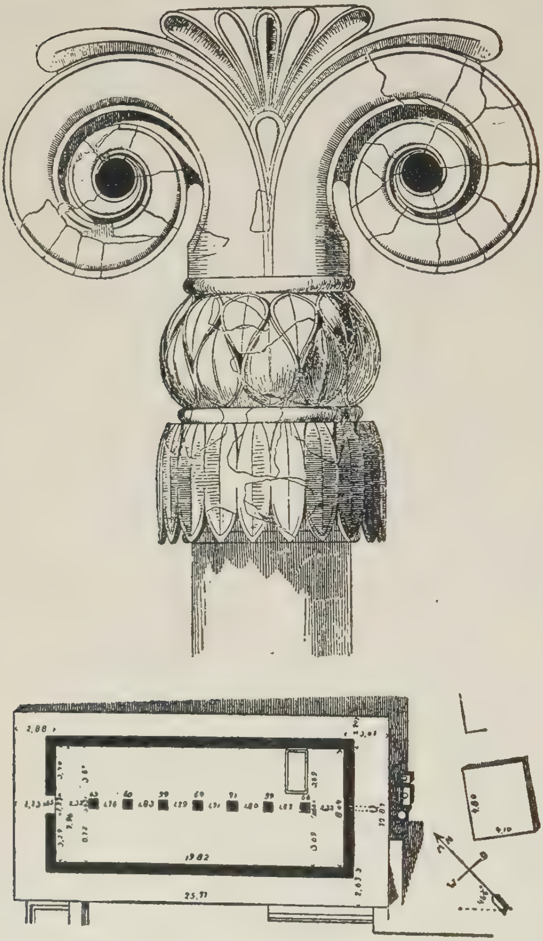

FIGURE 88. PLAN AND CAPITAL OF THE TEMPLE AT NEANDRIA.

From J. Durm's "Baukunst der Griechen" (1910), Fig. 285.

the interesting temple of Neandria in the Troad, which can hardly be later than the seventh century B.C. (Figure 88). A cella which measures interiorly about sixty-five feet in length by twenty-six in width rests on a platform about forty feet wide across the front. The plan is similar to that of the early Dorian temple of Artemis at Sparta. There was no surrounding colonnade, so that an unsheltered walk about six feet wide surrounded the cella, which was interiorly divided into two equal aisles by a row of seven columns directly in line with the door. These columns were tall and slender, a proportion much more suggestive of wood than of the stone in which they are wrought. The capitals recall the Persian capitals of later date, as at Persepolis and Susa, and like these must be due to an imitation in stone of the forms of metal applied to the decoration of wooden columns. The capitals vary in detail, but are all composed on the same scheme. The capitals consist first, immediately above the shaft, of a series of downhanging leaves carefully carved, which in some of the capitals form a torus-like profile. They are sharply undercut, forming a beak moulding, and so thin on the edge as distinctly to suggest metal, imitation of which is further indicated by the character of the modelling. A similar treatment is seen in the remains of a capital found at Ægæ. The same is true of the leaves growing alternately up and down, and somewhat suggestive of the later egg and dart, which form the decoration of the flattened torus above. From this grow upward two volutes placed vertically as in the Persian capitals, not horizontally as in the Ionic capital of normal type. They are well modelled with sunk eyes, the scroll being formed by a narrow fillet between which the surfaces are convex. The space between the volutes is occupied by an anthemion ornament and upon this part of the capital the beam directly rested. The volutes carried nothing. They are mere ornaments projecting on either side of and beyond the supporting member, which is hardly wider than the diameter of the shaft. The shafts were without flutes. The wooden beam which these capitals carried ran longitudinally along the line of the colonnade, while the capitals faced the entrance, their scrolls extending sideways at right angles to the direction of the beam. This alone would militate against the suggestion[1] that the form of the capital was the outgrowth of a bracket capital of wood, like those of the early

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[1] Durm, *Baukunst der Griechen*, 2d ed. (1892), p. 246; abandoned in 3d ed. (1910).

Renaissance in Italy. These capitals and others of the same type seem, like those of Persia, to reveal quite clearly their origin in the imitation of the forms of metal decorations applied to the top of a wooden shaft. The narrow fillet which forms the spiral strongly suggests metal. The scroll form, the spiral, is one that naturally results from the beating out of a metal band. It is so natural to the craft of the metal worker that in all ages we find the spiral or volute the most frequent form in all wrought metal work. The beam system and the roof which was supported by these columns of Neandria was entirely of wood and has of course long since disappeared.

A capital of similar form found at Messa is wrought with equal care. It seems to show an advance on those of Neandria. The spirals are drawn together and have relatively less spread, and in this case the wooden beam that rested upon the capital was much wider than the upper diameter of the shaft, which is about eighteen inches. The spread of the volutes in this case is about four and a half feet (1.36 m).

Several still earlier capitals found in Athens tell the same story (Figure 89). They are rudely oblong rectangular blocks not fitted to the circular shaft. Their faces are decorated with incised spiral lines emphasized by color. They probably show one of the first attempts to use the scroll form in the decoration of a capital of stone. A still later example at Athens shows the volutes set horizontally and with some shaping of the side of the capital into forms which correspond with the scrolls of the front. It is the beginning of the baluster-side of the capital. Below this volute-decorated cushion is a circular beak-moulding making the transition from shaft to scroll which both in profile and decoration recalls the leaf-decorated member above the shaft of Neandria. Its face is not carved as at Neandria, but rudely painted with lines which suggest down-hanging leaves recalling the forms of decoration of the Egyptian throat moulding. It is a primitive form of that member of support which in the later Ionic capitals is assimilated to the Doric echinus. The leaf forms, here crudely suggested in the color decoration, give probably the origin of the egg and dart of the later Ionic echinus. The relation to metal forms is still obvious. The capital is a hybrid. The forms are awkward and ugly.

It is not only in the capitals that these scroll forms appear. In Assyrian work the low reliefs show they were used also as the terminal decorations of

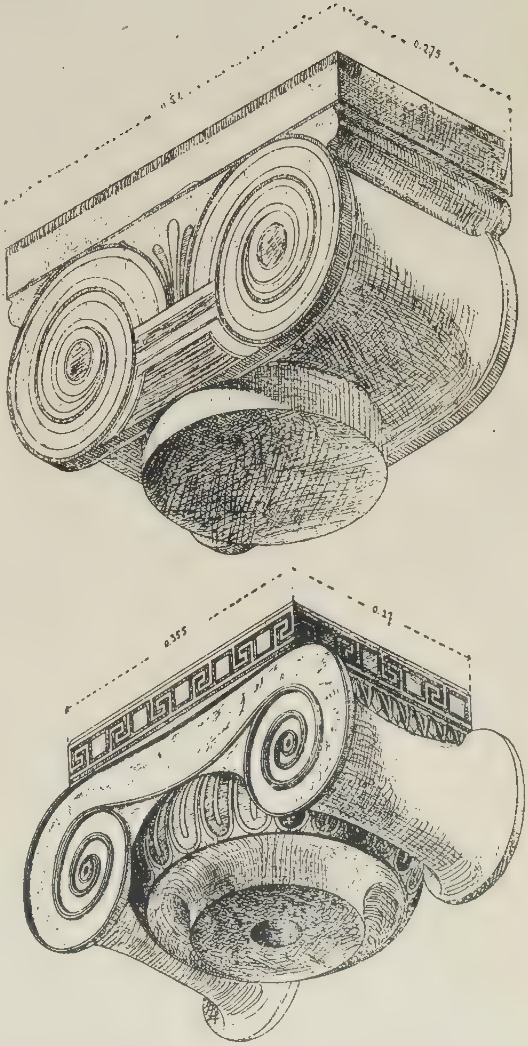


FIGURE 89. ARCHAIC IONIC CAPITALS FROM THE ACROPOLIS AT ATHENS.

From G. Perrot and C. Chipiez' "Histoire de l'art dans l'antiquité," Vol. VII (1898), Pl. 53.

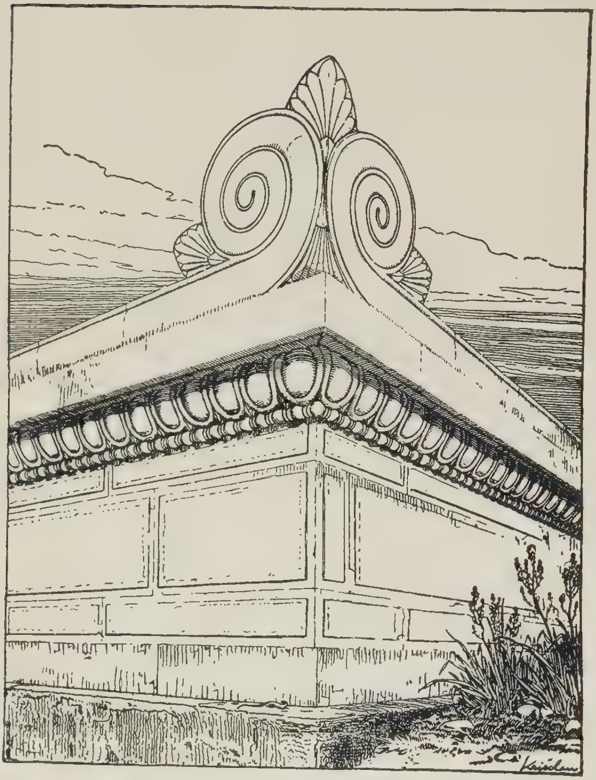


FIGURE 90. CORNER OF THE ALTAR ON CAPE MONODENDRI, RESTORED.

From A. von Gerkan, in Th. Weigand's "Die Ergebnisse der Ausgrabungen Milets," Vol. 1, Heft 4.

throne-arms, of supports of various kinds, of the projecting horns of altars. So also in the primitive Ionian work we find the spiral similarly used, as in representations of furniture in the vase-paintings, or in the decoration of a beam-end like that shown in the rock-cut tomb of Limyra.

An interesting example of such use of only slightly later date, contemporary with the earliest developed but still archaic Ionic forms, is the interesting Altar of Poseidon on Cape Monodendri near Miletus (Figure 90). Above the cornice of the altar is a band which, at the angles, turns up into scrolls precisely like the volutes of early Ionic capitals, forming thus angle acroteria. Somewhat harsh in design, it shows skill and precision in execution. The carved egg and dart of the cornice has the primitive U-shape like that of the early Ionic capital at Athens just referred to.

The earliest temples built in the free cities of the Ionian shore of Asia Minor and its islands were all destroyed during the struggles of these city republics against the Persian power which finally overcame them. It was not until after the overthrow of the Persians by Alexander the Great that they were rebuilt. Of these early temples, therefore, there have been found only slight fragments buried beneath or in the neighborhood of the later buildings. More thorough excavations on these sites will doubtless ultimately reveal more traces of the Ionic temples of the sixth and fifth centuries B.C. The fragments discovered show capitals with volutes of much wider spread than those of later times, and also more reminiscent of their descent from forms of metal, while the accompanying decoration shows the influence both of Assyria and of Egypt. The scheme of design, however, is already that of the later Ionic capital. Sometimes the spiral is without an eye. Such an example is the capital of the old temple of Artemis at Ephesus (Figure 91). In this as in all the examples of this period the space enclosed by the spiral-forming fillet is convex, not as in later examples concave. In spite of superior finish the scheme is not far in advance of these primitive Ionic capitals found at Athens, the spirals of which are mostly scratched on the surface of the block. The character of the volute and of the egg and dart is similar to that of the altar of Poseidon on Cape Monodendri already referred to. The shafts of this temple have the sculptured drums — the figures of decidedly archaic character — the architecturally unfortunate idea of which is repeated in the later temple of Alexandrine times.

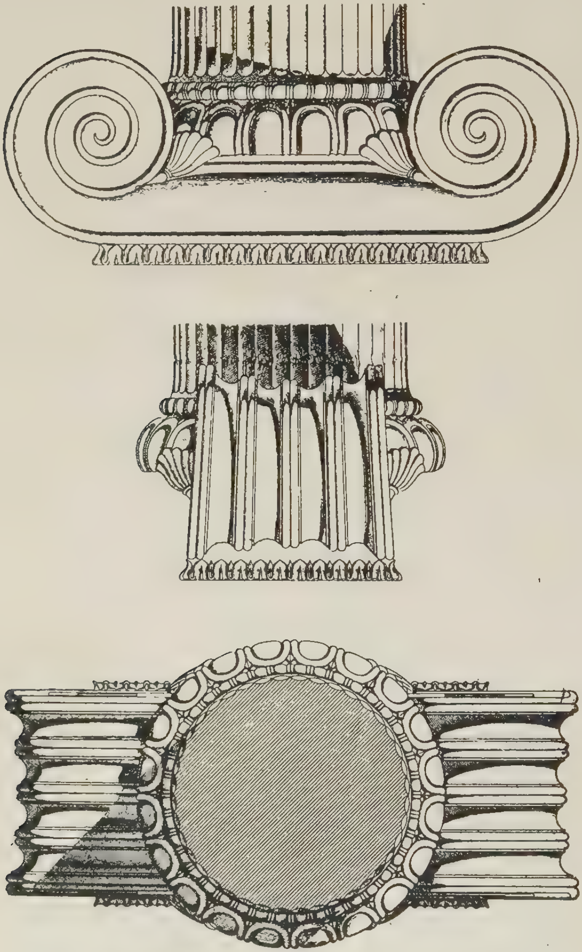


FIGURE 91. ARCHAIC IONIC CAPITAL FROM THE OLD TEMPLE OF ARTEMIS AT EPHESUS.

From G. Perrot and C. Chipiez' "Histoire de l'art dans l'antiquité," Vol. VII (1898), Pl. 10.

The flutes of Ionic shafts are separated by fillets, not by arrises as in the Doric, and the channels are deeper relatively to their width. The shaft is terminated above and below by a fillet, or a fillet and astragal. The number of flutes in the shaft is in this archaic period not yet fixed. The earliest of the three temples of Artemis at Magnesia, dating perhaps from the early part of the fifth century, had thirty-two channels. Twenty-eight seem to have been intended in the much later temple of Cybele at Sardis. At Naukratis and at Locri (Figure 92) the shafts, only slight fragments of which remain, had, above the termination of the channels (which here also were evidently more numerous than the twenty-four which later became canonical), a necking decorated with the anthemion. This necking is not separated from the rest of the shaft by an astragal as later in the similar necking of the columns of the Erechtheum at Athens. The columns have individual bases, which consist at first, as at Samos or Locri, of a circular disk channelled on its face. Later a torus is placed above the disk, which is transformed into two or more scotias separated by fillets, this circular portion of the base resting on a square plinth.

The volutes of the capital now indicate by their spread the direction of the architrave. They have the aspect of sup-

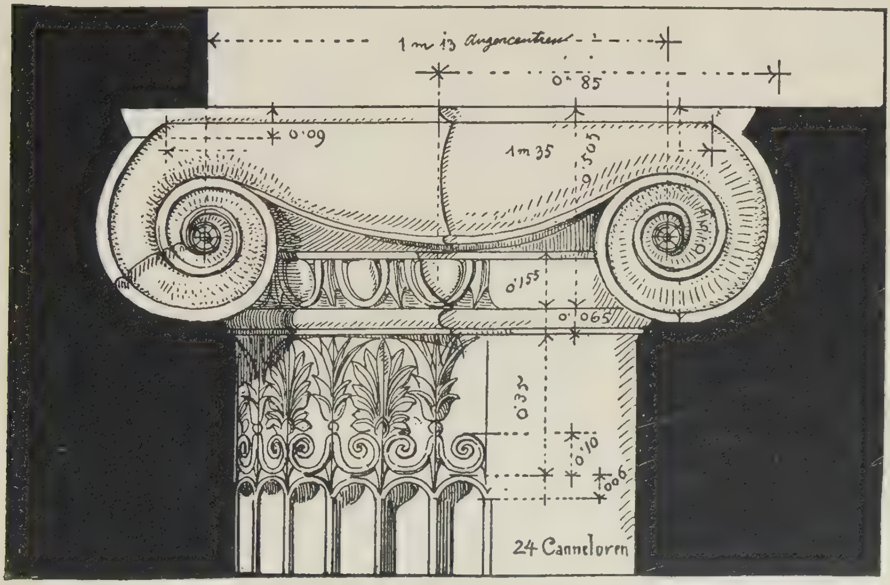


FIGURE 92. IONIC CAPITAL FROM LOCRI.
From J. Durm's "Baukunst der Griechen" (1910), Fig. 286.

porting brackets. From now on the volute is constantly used as expressive of upward support. It is noteworthy that in more modern times the designers of the Renaissance, in their borrowing of this form, employed the volute systematically as the most appropriate symbol of upward support. The appropriateness of such expression may be realized by recalling the frequency of its occurrence in nature, as in the upward-pushing fronds of ferns.

The entablature system of the archaic Ionic seems to have been normally — and quite certainly originally — without a frieze, and the absence of the frieze remains to the end a frequent characteristic of the Ionic order as used by the Greeks of Asia Minor. The architrave was generally subdivided into two or three fasciæ, contrasting here also with the simpler forms of the Doric. It is crowned by a group of mouldings, suggestive of a small cornice. The frieze, where it exists, is continuous. When, as perhaps always is the case at this early epoch, the frieze is wanting, the crowning members of the epistyle merge with the bed mouldings of the cornice. Above these occurs the most distinctive feature of the cornice of the Ionic style of Asia Minor: the dentils, a series of projecting blocks surmounted usually by a continuous moulding which supports the corona. These dentils perform in the cornice the function of brackets. In the earlier examples it is noteworthy that they have greater projection than is later given to them. In Asia Minor they retain to the end a degree of projection which is excessive for such members of stone. A reflection of the most archaic form of the Ionic order in stone is given in the rock-cut façade of a tomb at Antiphellus in Lycia (Figure 87).

The forms of the Ionic entablature are clearly derived from wood (Figure 93). The evidence of the rock-cut tombs of Lycia and Caria and the analogy of the later wooden entablatures of Persia seem to make this abundantly clear. It may with safety be concluded that the fasciæ of the epistyle were suggested by the superposed planks which formed the early wooden architraves or beams, and that the dentils are derived from the appearance of the rafter ends which rested upon the beams and projected to carry the overhang of the eaves.

An analysis of the Ionic order of stone as found in the later Attic monuments and a comparison of this modified

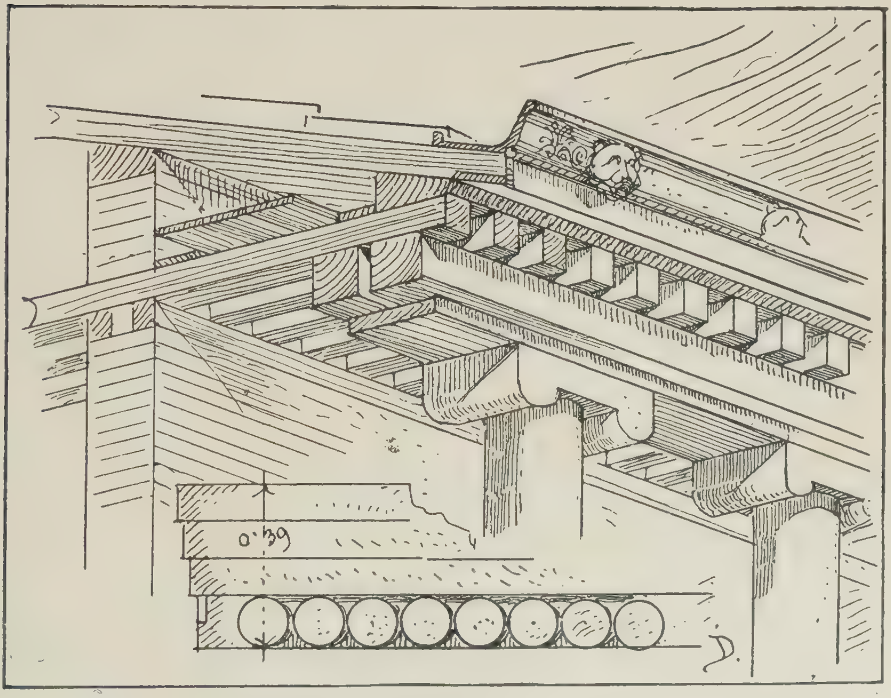


FIGURE 93. SUGGESTED WOODEN ORIGIN OF THE IONIC ENTABLATURE.
From J. Durm's "Baukunst der Griechen" (1910), Fig. 315.

Attic Ionic order with what may be called the pure Ionic or Asiatic Ionic order as finally manifesting itself in Ionia in the time of Alexander the Great will, at this point, be helpful, before passing to the consideration of the Attic monuments themselves, in which Doric and Ionic currents met. There can be no doubt that the Attic influence is felt to some extent in this later growth of the Ionic style in Asia Minor in the greater refinement and more logical development of the forms which still nevertheless here generally retain their pure Ionic character and even a certain degree of Asiatic redundance.

The Ionic order in its full development in these two forms — Attic and Asiatic — is not less structurally expressive than the Doric. Its forms are hardly less logical nor hardly less suited to the material — stone or marble — in which the buildings were carried out. Though of secondary origin they were finally, through constant shaping by the sensitive feeling of the craftsman for his material, so assimilated to stone as to come into entire harmony with it, in spite of some reminiscence of this origin which to the end leaves them less completely expressive of their material than the primary Doric. But as was pointed out above, these structural conceptions are expressed with more elaboration, the use of a larger number of terms to express the same ideas.

The more refined and more sensitive Athenian felt that this greater elaboration of form was better suited for buildings of moderate size. There was about it a certain preciosity which made it more appropriate in his eyes for use either on a smaller scale than the more robust and simpler Doric, or as an interior order. The Ionian, on the other hand, used the order for all purposes, and was fond of temples of great scale. This difference of scale and of use in itself marks a striking difference in the character of the Ionic order of the Attic style and the Ionic order as the mark of the Ionic style of the coast land of Asia Minor.

As in the Doric, the main subdivisions of the order — stereobate, column, entablature — express the threefold structural functions of basing, support, and crowning. The stereobate of the Ionic temple was usually similar to that of the Doric, but occasionally, both in Attica and in Ionia, even this base of the building, in sympathy with the generally more enriched character of the order, is given a less stern character by a broad sunk fillet, or quirk, below each plinth. The column in the Ionic order receives, like the whole order (and in this respect unlike the Doric column), its full threefold division into base, supporting shaft, and crowning capital. The base of the column in the earlier Ionic has been described. The Attic designer felt this base to be lacking in refinement and redundant in expression. He therefore devised a base not less rich, but more expressive. It is the form of base known as the "Attic Ionic" or simply as the "Attic" base (Figure 94). This invention is of the utmost importance in the history of architec-

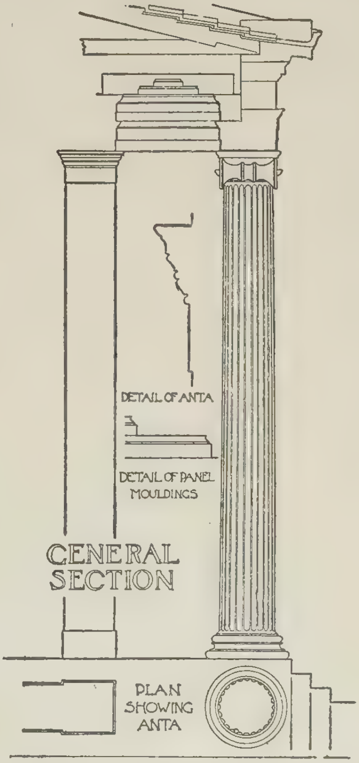


FIGURE 94. DETAILS OF THE IONIC ORDER.

From a drawing prepared under the direction of the author.

ture, for it is the form which, with modifications, continued in use through all subsequent European styles: Roman, Byzantine, Romanesque, Gothic, and Renaissance. It was so perfectly expressive that once introduced no essentially different form seemed possible as the base of a column. It consists essentially of an upper and lower torus separated by a scotia, each of these three members articulated by fillets. These are so proportioned and profiled that the whole group becomes admirably expressive of the downward pressure of footing: the firm basing of the column on the ground. In this base the Attic designer dispensed with the plinth, which seemed to him redundant, and to interfere with circulation about the column. As the base of the Doric shaft may be regarded as merged in the stylobate — the common base of the colonnade — so in the Attic Ionic order the plinth may be regarded as similarly merged. Its absence has the effect of unifying the whole colonnade, an expression which the Attic craftsman always carefully sought, bringing it at the same time into more harmonious relation to the Doric order, side by side with which in Attica the Ionic was used. In the pure Attic base the face of the upper fillet of the scotia comes vertically below the outermost point of the curve of the torus just above. Sometimes the upper torus, sometimes the lower, is the larger. One of them always dominates.

In the Asiatic form of the order the base — even in the later period — retains much the character of the earlier form. It consists usually of an upper torus, below which are a series of scotias separated by fillets or fillets and astragals. The base usually has a plinth, which is sometimes octagonal or polygonal in plan. Its general effect is weak and fussy. The redundant forms have sometimes almost the appearance of a pile of plates, an effect often increased by horizontal fluting of the lower half of the upper torus. It is strikingly inferior to the Attic form of base.

Consistently with the fundamental conception of the order, which requires the fullest expression of function in every member, not only has the column its threefold division, but this is given to the shaft itself. It also has its individual crowning and basing members apart from the column-capital and base. It is terminated above and below by an outward curve (the *apophyge* or *congé*) and a fillet, or frequently a fillet and astragal. The lower astragal of the shaft rests immediately on the upper torus of the base. The shaft has but slight diminution, and usually a very delicate entasis. The characteristic slenderness of the order is further emphasized by giving the shaft twenty-four flutes instead of the twenty usual in the Doric. The deeper channelling and the separation by fillets adds to the emphasis of the flutes and the consequent expression of verticality. The numerous flutings of the archaic order, which resulted from the traditions of wood technic, are now abandoned in favor of a treatment more in harmony with the harder and firmer material.

A similar transformation overtakes the capital. Its forms are modified to accord better with stone technic and the natural character of this material. The lower member of the capital is now always an echinus of very low proportion which rests directly upon the upper astragal of the shaft. Sometimes this echinus is cut on the same block as the upper drum of the shaft, the joint between shaft and capital coming above the echinus instead of below it. It is clear that this form was adopted as the result of Doric influence. It completely does away with the reminiscence of metal given by the earlier, attenuated, down-hanging leaves. The echinus is usually carved with the egg-and-dart decoration, which is so adjusted that an egg comes over each flute and a dart over each arris. This unites shaft and capital in a strikingly effective way. The echinus is partially hidden by the down-hanging volutes of the capital. On the echinus rests the cushion which forms the volutes. These are now more drawn in. Their projection beyond the shaft is much less. The spirals start from a central circular eye. The earlier volutes were drawn on the stone free-hand. There is little doubt that in the fifth century and later the spirals were formed by inserting into the sunken eye a wooden screw spiral on which a cord was wound. The volute was then described by unwinding this cord with a stylus attached to the end of it. There were several elements of possible variation in the volute. The size and position of the eye might vary. The proportions of the spiral might be different, and finally the moulding forming the volute might be of varying section. In the Attic work of the fifth century and later it is often a single scotia outlined by fillets or by a fillet and astragal, or it may be two scotias similarly defined. The moulding forming the scroll may revolve twice or three times or over about the eye. The volutes of the orders of no two temples are precisely alike. The two volutes in the best Attic works are connected on the lower side of the cushion by a swinging line which gives great vitality to the form of the capital. In the period of Alexander the Great this line stiffens and finally it is absolutely straight. The baluster side of the capital varies even more strikingly, both in section and in the mode of its decoration. The possibilities of individual variation in the capital are therefore endless. The abacus is very low and the section of its face has the form of a flattened echinus or Lesbian cyma. In plan its normal form is square. The column as a whole gives, as will be seen, a very rich and effective expression to the idea of upward support.

The fact that the form of the Ionic capital, unlike the Doric, expresses the direction of the beam and is different on the front and on the sides requires at the angle a special form of capital in order to avoid the awkwardness and weakness of effect that would have resulted from presenting to view the baluster side of the capital of the angle column, which would have been consequently out of harmony with the appearance of all the other side capitals. Such a special form was always used. The two adjoining outer faces both had volutes, the corner volutes meeting and projecting at an angle of forty-five degrees to the two façades. The baluster sides of the corner capitals were slightly bowed out and two half-volutes usually showed on the inner angle. This was somewhat awkward, but was practically unobjectionable since it was not conspicuous.

In the entablature the horizontal fasciæ of the epistyle, already described, contrast with the simplicity of the Doric architrave. They serve to emphasize the horizontality of the beam, and thus insistently express its function. The proportions of the crowning member in relation to height of the epistyle recall the proportions of the entablature to the height of the whole order and the relation of capital to column, and follow still more closely the proportion of the height of the geison together with the superposed cymatium to the total height of the entablature. These echoes of proportion consonant with function serve to give a rhythmic unity to the design of both the Greek orders.

The frieze is not an essential member of an order. It is in the nature of a piece of wall resting on the epistyle. Its use or omission is a question of proportion. In the sturdier Doric it is seldom if ever omitted. In the Ionic order, though usual, it is not infrequently omitted. When it occurs it is continuous and is usually a field for figure sculpture, whence its Greek name of *zoöphorus*, the life-bearer. Its simple continuity might at first thought seem to be a contradiction of the generally richer character of the order as compared with the Doric triglyph-frieze. The resolution of the frieze, however, into these emphatic points of support has the effect of making the Doric frieze more robust, more sturdily structural in appearance, while the continuous sculpture of the Ionic frieze greatly adds to the richness of effect. Indeed this figure-sculptured frieze is the most sumptuous feature of the order, and its continuous movement is in sympathy with the somewhat quicker rhythm and the grace of effect which are Ionic characteristics.

The most striking difference between the Attic and Asiatic forms of the order is to be found in the cornice. The Attic designers simplified it and omitted the dentils altogether, thus assimilating it to the Doric cornice. In scheme it is almost precisely like the raking cornice of Doric pediments. It is the cornice reduced almost to its simplest terms: the geison, deeply undercut, a very simple bed moulding below, as a support, and the crowning cymatium or gutter moulding above. This has sometimes the form of a full-curved echinus, but more often takes the characteristic outline of the Ionic cyma, — similar to the Roman cyma recta, — the most graceful and one of the most appropriate mouldings of free-ending or crowning. The pure Ionic style almost invariably makes use of this form, and the pure Ionic has always the dentils with a moulding above and another below, — the threefold division again in the bed moulding itself, — consistent with the greater elaboration which belongs to the Ionic style. If the Attic type of the order is firmer and stronger, more in harmony with the Doric forms with which it is constantly associated, the pure Ionic order is richer and more sumptuous and has more of that feminine grace on which Vitruvius so strongly insists, in contrast with the virile Doric.

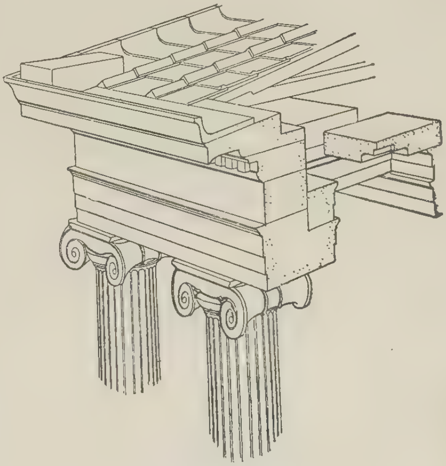


FIGURE 95. CONSTRUCTION OF THE IONIC ORDER.
From a drawing prepared under the direction of the author.

Like the Doric, the Ionic style made use of color in the decoration of its buildings and especially in the appropriate ornaments of its mouldings; but while in the pure Doric these mouldings are not carved (the exceptions reveal other influences), in the pure Ionic they are always so, and the color is then added as a further enrichment of the modelled surface.

As there are no triglyphs in the frieze of the Ionic order, the spacing of the columns admits of more freedom. The intercolumniations vary chiefly with the scale, being determined by the practicable length of a marble beam. This results in the relatively closer spacing of columns of great height. The system of intercolumniation is similar to that of the Doric. The central intercolumn of the front is usually made wider, and the angle intercolumns are often slightly diminished, although less so than is required in the Doric. This fact clearly shows that the Greek designer felt that a narrowing of the corner intercolumns was an advantage, not a disadvantage, to his design.

The formation of the ceiling over the pteroma was in Ionic temples similar to that used in the Doric architecture, namely, a series of marble beams carrying coffered slabs (Figure 95). These beams in the Ionic order always rested directly on the epistyle. They therefore, when there was a frieze, came behind the frieze, not behind or even slightly above the cornice as in Doric buildings. We have already seen what bearing this fact may have on the theory as to the wooden origin of the Doric triglyphs.

THE CULMINATION IN ATTICA

In Attica Doric and Ionic influences intermingled. This fruitful marriage produced here the noblest flower of Hellenic civilization. In government, in philosophy, in literature, in all the arts we find in Athens that culmination of all that was finest in Greek life.

In architecture this contact produced that perfect Attic style in which Doric and Ionic forms intermingled and mutually modified and fulfilled each other. Not only were the Doric and Ionic orders used side by side in the same building, their forms no longer marking separate styles but commingling in one style, thus making possible a greater variety of expression; but in Attic hands neither the Doric nor the Ionic orders remained what they had been. Each borrowed something of the character and peculiarities of the other; both were treated with greater refinement, greater delicacy and justness of feeling, those modifications harmonizing their forms so that they fused to form a single style. In the process the Doric forms became more delicate, the proportions more slender, while the Ionic forms became simpler, more structural in expression, and firmer in handling.

At the close of the struggle against Persia, when in 479 B.C. the Greeks in the victory of Platæa finally drove back the hosts of the Asiatic despot, the Athenians, who had returned after Salamis, found their city desolate: its walls thrown down, its temples ruined, its houses laid waste and uninhabitable. But they were stimulated by the sense of heroic accomplishment, and by the beckoning dream of a great future. The almost unbelievable success against the Persian world power was the work of a combined Hellenism of which they had been leaders, and they presently found themselves at the head of a powerful league which gave permanent security against the Persians, which seemed even to promise politically Hellenic greatness under the lead of Athens. They were inspired by the recent memories of Marathon, of Salamis, of Platæa, and these were victories not in a sordid struggle for predominance against fellow Greeks, but had the new stimulus of a Greek union against the foreign invader. They were the victories of liberty, which preserved for Attica, for Greece, — for Europe had they been able to comprehend it, — the freedom of the individual to develop in freedom, to express his ideals in his own way in the free air of democratic institutions, his liberty controlled and harmonized by devotion to common ideals and by a common ambition for the strength and welfare of his community. The victory of Greece against Persia was much more than the maintenance of independence against conquest, it was the victory of ordered democracy against ruthless, powerfully organized military absolutism, an absolutism which enforced order by suppression, and which in its conquest of the Greek cities of the Ionian shore had destroyed the great temples it was incapable of replacing.

In the midst of the influences and memories of this great salvation the period of a generation was spent in rebuilding the houses of the city, in building anew and extending its walls, — those great walls which surrounded Athens and connected it with the ports of Peiræus and Phalerum, — and under the guidance of a succession of great leaders the determination grew to make the city in its outward aspect worthy of its new greatness. The temples on the Acropolis especially were to be rebuilt on ampler scale and with greater beauty and splendor. But one of the virtues most insisted upon in the Athenian democracy was that of moderation, of temperance. Moreover, even the increasing commerce and the enlarged resources that came to Athens as tribute from other members of the confederacy of Delos did not bring to her such vast wealth as the despots of Egypt and of Asia had controlled. The Athenian democracy, it is true, was based upon a slavery which in the world of that day was universal, but there was no possibility of such enforced levies of large populations as had made possible the pyramids and colossal temples of Egypt, or the vast palaces of the despots of Babylon, of Nineveh, or of Persepolis. Nor was there at Athens any of that ambition for mere size which was characteristic not only of Asia and Egypt, but even expressed itself — to the limit of powers available — in the buildings of the Greek colonists in Sicily. After Himera, Akragas built the "Temple of the Giants"; after Salamis, Athens reared the Parthenon. The Athenian craftsman of this great period sought to excel in beauty and exquisite finish, not in size, and showed a refinement and a sense of proportion in striking contrast to the barbaric and colossal splendors of the East and greatly superior to that of his fellow Greek in the colonies. He rapidly developed an unexampled delicacy and skill of execution, an unsurpassed beauty of conception and power of expression, gifts which no amount of analysis of inheritance or environment can altogether explain any more than similar investigation can explain the appearance at this or that time and place of the individual genius. Yet neither can be understood without a knowledge of the conditions under which each has developed and attained its great powers. Consummate attainment in this or that art appears now here, now there, as if by chance. "The spirit bloweth where it listeth, nor canst thou tell whence it cometh nor whither it goeth, so is every one that is born of the spirit," — and yet the great time, the great genius, never appears unheralded. It is never an unrelated, a detached phenomenon: a knowledge of time and place and circumstance helps both to a sympathetic appreciation, and an understanding comprehension of its relation to universal life. The discerning eye will recognize even in the earliest and crude beginnings of Greek art a promise, a sense of beauty even, not to be found in the more skilful art of contemporary Egypt or Mesopotamia, where an early naturalism of great delicacy and skill had stiffened into convention.

But the remarkable thing about the Attic development is that a people who two short centuries before were crudely forming the beginnings of their art, were in almost childish fashion shaping their stiff archaic figures, or awkwardly rearing structures of no great beauty, should so rapidly, almost suddenly, develop an art which the world has never seen surpassed, and which for sheer beauty of sensuous form has never been equalled. While it is true that freedom has only once produced these results, we are justified in doubting whether elsewhere than in the free air of Greece the miracle could have been wrought. That such beauty should have grown in the stifling atmosphere of the despotisms of Egypt or Babylonia seems unthinkable.

One circumstance which qualified the precise form of the Attic development at this time was the introduction of the general use of marble. The Attic style of the fifth century is essentially a style of marble, and owes to the possibilities of this noble material much of its delicacy and refinement. Of these possibilities the Attic craftsman made the utmost use.

The wonderful Athenian development centred on the Acropolis, which rapidly became the most beautiful architectural site the world has ever produced (Figure 96). The story of its buildings, which excavation and archæological inquiry has during the past century been gradually revealing, the earliest chapters of which were opened to examination by the exhaustive Greek excavations of 1884–1886, is not only in itself a story of most romantic interest, but is an epitome of the history of Greek art in its most important manifestations.

The early history of the Acropolis, as these investigations have revealed it, can here be only rapidly passed in review.

The great rock, which became the citadel of ancient Athens, was the last and the boldest outpost of the Attic mountains. Its sides, except on the west, are precipitous cliffs. Its only possible approach is from the steep western slope. Its nearly flat top measures roughly about a thousand feet in length from east to west and about five hundred feet in width. It is about three miles from the sea. It ideally fulfils the requirements of early settlements. It is therefore not surprising that it was inhabited from early times. In the prehistoric period its summit was surrounded by cyclopean walls, the remains of which the excavations have uncovered, following the natural outline of the hilltop. It then

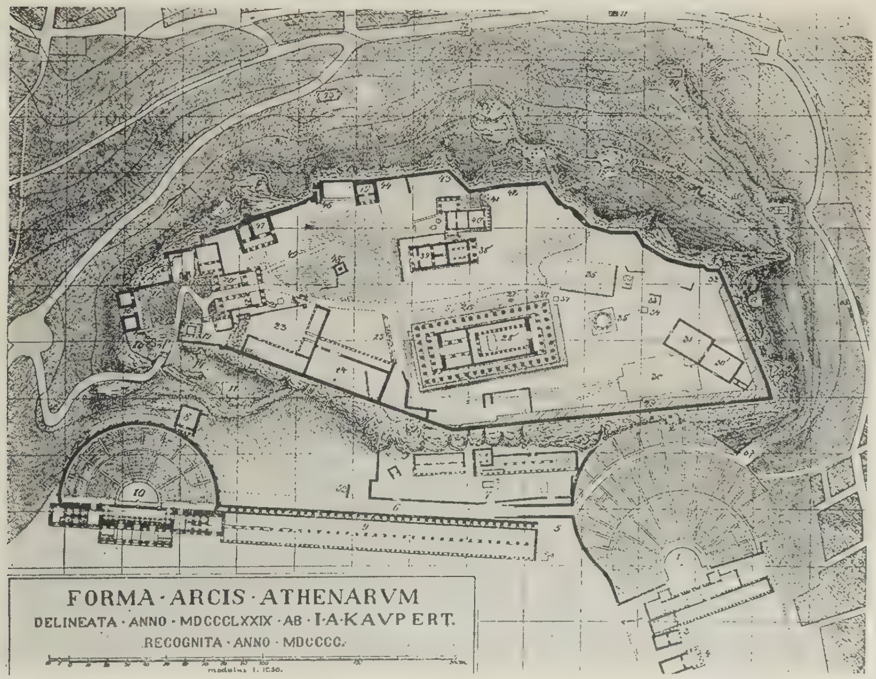


FIGURE 96. GENERAL PLAN OF THE ACROPOLIS AT ATHENS.
From the drawing by J. Kaupert in A. Michaelis' "Tabulæ Arcem Athenarum Illustrantes" (1901), Pl. 7.

constituted the city, and here for long centuries the king and his nobles continued to live, while gradually, as at Tiryns and Mycenæ, a settlement grew up at its base. Quite early the western approach was further strengthened by a series of roughly concentric walls, of which hardly any remains have survived, but which continued to exist, at least in part, down to Roman times. It was called the nine-gated Pelasgikon, because of its supposed construction by the Pelasgi, a term which was popularly corrupted into Pelargikon (Stork's nest), by which it was usually known. Some remains of the king's palace, the steep flight of steps, as at Tiryns, leading to the postern on the north side, and foundations of other prehistoric dwellings exist in the neighborhood of the Erechtheum. It would seem that this shrine of the mythical early king was purposely built on the site of the prehistoric royal palace. The first of these shrines of Erechtheus, associated with that of Pandrosos-Athena, dating probably from the seventh century, is in all likelihood represented in a pedimental relief from the Temple of Athena of the time of Pisistratus. Remains of several other unidentified shrines have also been found, but their architectural character cannot be established. To this period belong those capitals of archaic Ionic style which have already been referred to.

The worship of Athena as the principal and tutelary deity of Athens seems to owe its firm establishment to the tyrant Pisistratus who, it is said, had himself accompanied in triumph to the Acropolis by a stalwart woman in a chariot, armed to represent Athena, when in B.C. 560 he overthrew the republic and forced his recognition as absolute ruler. He occupied the Acropolis as his citadel, for the greater part of the city was now in the plain. He built a new gate, the foundations of which still remain beneath the present Propylæa, and may have built the Hekatompedon, the hundred-footed Temple of Athena from about 560 B.C., whose foundations have been unearthed between the Erechtheum and the Parthenon (Figure 97). This had originally the form of a simple *sekos*, or temple without peristyle, having Doric porticoes distyle in antis on each end. In plan it had an eastern nave divided into three aisles by colonnades and a western chamber (F) entered from the epinaos, beyond which were two smaller apartments supposedly used as treasuries. To this temple have been ascribed the curious archaic figures belonging to a pedimental group representing the struggle of Hercules against Triton, with the three-headed Typhon, carried out in limestone from Mount Hymettus. The strong polychrome decoration in stucco of this group is still in a

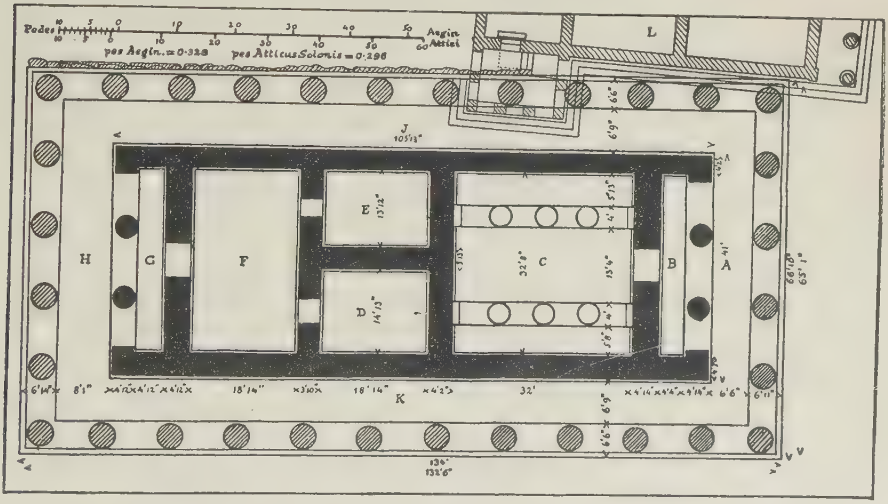


FIGURE 97. PLAN OF THE OLD TEMPLE OF ATHENA ON THE ACROPOLIS, RESTORED, SHOWING THE CELLA IN ITS ORIGINAL FORM.

From the drawing by W. Dörpfeld in A. Michaelis' "Tabulæ Arcem Athenarum Illustrantes" (1901), Pl. 5.

remarkable state of preservation. To Pisistratus also belong the substructures of the colossal Temple of the Olympian Zeus in the lower town; but it remained for the Romans to rear a temple on these foundations.

The sons of Pisistratus — Hippias and Hipparchus — seem to have transformed the Hekatompedon, making of it an Ionic tetrastyle amphi-prostyle building, and then to have surrounded it with a Doric colonnade with pedimental groups, fragments of which of very fine character still exist, especially as shown in the noble treatment of the head and pose of Athena, in the group showing the goddess overthrowing the giant Enkelados. The style of these sculptures shows a striking advance on the almost comical archaic heads of the Typhon group.

To the time of Cleisthenes, about 506 B.C., probably belongs the first project for the Parthenon on the site later occupied by the Periclean temple, taken up on a modified scheme after the battle of Marathon. The plan of this earlier Parthenon in its final form was somewhat shorter and narrower than the structure of the time of Phidias (Figure 98). But except for the abortive beginnings of the colossal Temple of the Olympian Zeus, it was far larger than any structure hitherto undertaken by the Athenians. The position selected for the new temple involved the building of a huge platform, the foundations of which on the south side ran down for some thirty feet to the living rock. This was completed and the first drums of the new structure were in place when the invasion of Xerxes put an end to the work.

Besides laying waste the lower town, the Persians destroyed all the buildings of the Acropolis by fire, so far as this was possible, and overthrew the colonnades. On the return of the

Athenians to the ruined city under the leadership of Themistocles their first care was to strengthen their fortifications and rebuild their houses. Themistocles also constructed a new rampart of squared tufa blocks on the line of the Mycenæan north wall of the Acropolis overthrown by the Persians, and built into it in plain sight, as a memorial of the Persian destruction, tufa entablatures, marble metopes, and portions of the colonnade of the Hekatompedon, and twenty-six still unchannelled drums of the projected Parthenon. This wall still remains unchanged. After Themistocles' banishment in 471, Cimon built the great south wall of the Acropolis, following straight lines outside of the remains of the cyclopean wall. It was not only a rampart, but a great retaining wall nearly twenty-five feet thick at its base, about eighteen feet thick at the top, and some sixty feet in height, exclusive of the parapet. This was filled in to make a level space beyond

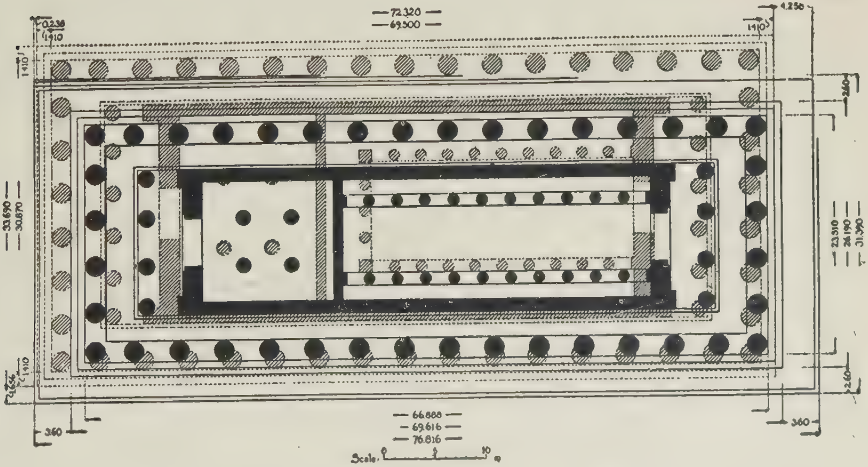


FIGURE 98. GROUND PLANS OF THE EARLIER AND THE LATER PARTHENON.
From the drawing by W. B. Dinsmoor in G. F. Hill's "The Older Parthenon" in "American Journal of Archæology," 2d ser., Vol. XVI (1912), at p. 535.

the foundations of the Parthenon. During this time the old temples, including the Hekatompedon, had been temporarily restored to serve the purposes of worship.

It was not until the administration of Pericles, who came into power in 461, that the splendid programme of a rebuilding of surpassing beauty on the Acropolis was formulated and vigorously pushed forward. The increasing commercial prosperity, the tribute of the allies, the profits of the mines owned by the state, furnished abundant means. The first work was undertaken in 450. Meanwhile a new generation, to whom the glorious struggle and the distressing sufferings of the Persian wars were but a tradition, was growing up and beginning to gain influence. Phidias, the great sculptor, whom Pericles placed in general control of his scheme of monumental reconstruction, was born about the year of Salamis. The first works were Phidias' statues of Athena Lemnia and the bronze colossus of Athena Promachus, which rose between the Propylæa and the Hekatompedon (Figure 96 : 48), seen from afar as guardian of her sacred citadel. At the same time Callicrates, builder of the long walls and later associated with Ictinus in the building of the Parthenon, was commissioned to build, on the bastion to the south of the Propylæa (19), the little shrine of Athena Nike, the "Wingless Victory," although the execution of this was apparently postponed until about 432. Besides this wondrous little sanctuary of Athena as goddess of Victory, the great projects included the Parthenon (28), built between 447 and 432, the Propylæa (20), from 437 to 432, the Chalcotheke or treasure-house (24), and the new Erechtheum (40), which was not finished until long after the death of Pericles, about 404 B.C.

It may be well to sketch here in brief outline the subsequent history of the Acropolis. For four hundred years it remained practically unchanged. The many votive offerings, of which the most notable was the gift, about B.C. 206, by Attalus I, King of Pergamum, of four sculptured groups comprising sixty figures, did not alter its aspect. In the time of the Roman emperor Augustus, between the years 27 and 15 B.C., the Athenians, in recognition of benefits conferred, set up a statue of the emperor's son-in-law Agrippa riding in his quadriga, the tall pedestal of which, awkwardly placed to the north of the roadway leading to the Propylæa, is still a most conspicuous object at the entrance to the Acropolis. About the same time a circular Temple of Augustus and Roma, the order of which was crudely modelled on that of the Erechtheum, was placed plump in front of the eastern or main entrance of the Parthenon. More unfortunately, departing still further from the character of the Periclean monuments, the Romans between 37 and 41 A.D., in the time of the emperor Caligula, changed entirely the old picturesque winding approach and substituted a great formal flight of marble steps, enclosed in straight walls and entered at the foot between two towers. The gateway was subsequently again changed, and embellished by the entablature from a Doric choragic monument of a certain Nikias, which in 319 B.C. had been placed at the foot of the Acropolis on the southern side. This gateway, entirely buried out of sight by subsequent structures, is now known from its French discoverer as Beulé's Gate. The long flight was divided at about one third its height by a landing, beyond which a straight incline, accessible through a postern at the foot of the Nike bastion, gave approach for animals.

The centuries of despoliation under Roman and Byzantine emperors may be passed over with a few words. In the time of Justinian, or not long after, the Parthenon and the Erechtheum had already been changed into churches. The Parthenon became the cathedral, dedicated to the Virgin Mary, and the Erechtheum a church of the Theotokos: Mary as the Mother of God. In the twelfth century the Propylæa served as archiepiscopal residence, with chapels of St. Michael and St. Gabriel. The entrance to the Parthenon was now at the west, following the now usual orientation of Christian churches. The opisthodomus met admirably the needs of a narthex and from it a great door was pierced to the naos, the scheme of which with its nave and side-aisles had already passed into the accepted scheme of church building. An apse was built in the pronaos and the nave was vaulted with a barrel-vault. The building thus met all the requirements of the Christian ritual. When in A.D. 1205 Constantinople was taken by the *soi-disant* "Crusaders," led by the selfish ambitions of the Venetians under their blind doge Enrico Dandolo, the Athenian acropolis, in spite of robberies and Roman and Byzantine changes, still retained in the main its ancient aspect. After the Venetian conquest Athens was ruled successively by Catalan, French, and finally Florentine dukes of Athens, who established their residence in the Propylæa, the colonnades of which were filled with window-bearing screen-walls. The churches in the Parthenon and Erechtheum passed now to the Roman rite. The ancient walls of Themistocles and Cimon were clothed with a revetment of smaller masonry strengthened especially on the south wall with huge buttresses. A massive mediæval tower arose over the south wing of the Propylæa and in the fifteenth century a terraced bastion for cannon covered the Gate of

Beulé and the Roman steps, the roadway now again winding up irregularly in mediæval fashion and entering the Acropolis, not through the Propylæa, but to the south of it at the foot of the new gate-tower. After the conquest of Constantinople by the Turks in 1453 and their occupation of Athens after a prolonged siege in 1458, the Parthenon was transformed into a mosque and an incongruous Moslem minaret was added. The Propylæa became the residence of the Turkish governor and the Erechtheum was used as his harem.

So far the noble buildings of the Acropolis had suffered abuse and defacement. They were now to undergo destruction. The first to suffer was the Propylæa, which in part was used as powder magazine for the adjoining batteries. The magazine was exploded by lightning in 1646 and the whole interior of the Propylæa blown up. The ancient columns were in part saved by the adventitious walls and vaults. In this condition the Acropolis was seen by the first modern European travellers. In 1674 a Flemish artist made for the French ambassador, the Marquis de Nointel, the first drawings of the Parthenon and its pedimental sculptures — drawings generally known by the name of a supposed author, Jacques Carrey. The central group of the eastern pediment had already disappeared in the changes the building had suffered, but the western pediment was intact. These drawings, now preserved in the Bibliothèque Nationale in Paris, are invaluable as showing the original composition of these groups. In 1676 the Frenchman Spon and the Englishman Wheler passed through Athens and described what they saw. There followed in the year 1686 the destruction of the Parthenon. The Venetians, under their general Morosini, were besieging the Turks, who to strengthen the fortifications at the entrance to the Acropolis had taken down piece by piece the Nike temple and built it into a new battery between the monument of Agrippa and the bastion of Nike. The Turks, believing perhaps that the Venetians would spare the Parthenon, used it to store each day's supply of powder for their artillery. Morosini, learning of this, ordered his guns trained on the Parthenon and a German lieutenant of artillery serving among the mercenaries employed by the Venetians put a bomb through the roof. The whole centre of the Parthenon was blown out and for days the fire raged. The Turks surrendered. The sculpture of the pediment was further damaged when Morosini tried to remove the horses of Athena and his workmen dropped and broke them. The Turks on reoccupying the Acropolis built a small mosque in the midst of the ruined Parthenon, and the Acropolis was covered with the small houses and narrow streets of a Turkish settlement.

In this condition it was seen and drawn by the English architects Stuart and Revett, who in the years 1751 and 1754 made a painstaking examination and measurement of the ancient buildings of Athens, especially of the Acropolis, an invaluable and singularly full record, which first made Greek architecture familiar to western Europe. In 1800 to 1804 the British ambassador to the Porte, Lord Elgin, succeeded in securing permission to remove certain sculptures, and transported the finest of those of the Parthenon and Erechtheum to England, where in the British Museum they are now known as the Elgin marbles. This proceeding subjected Lord Elgin at the time to a parliamentary inquiry and has been hotly criticised, but, as Michaelis has pointed out, it saved these great works of art from further mutilation and destruction during the Greek wars of liberation which followed between 1824 and 1832. During these wars the Acropolis was twice again subjected to siege alternately by Greeks and Turks, and the bombardment did further damage especially to the Erechtheum, the west wall of which was overthrown. In 1834 Greece became free, and in 1836 Athens, then hardly more than a cluster of huts below the ruined Acropolis, was made the capital of the new kingdom which England, France, and Russia created. From then on followed the period of rediscovery, removal of mediæval and Turkish structures, and of excavations, the chief landmarks in the history of which are the discovery and rebuilding on its old site of the Nike temple by the Germans, Ross, Schaubert, and Hansen in 1835; the finds in 1852 by the French archæologist Ernest Beulé; and — most remarkable of all — the thorough excavations undertaken between 1886 and 1889 by the Greek archæological society, which revealed the pre-Periclean acropolis. We are now in the period of restorations, an activity not without its new dangers to the ancient remains.

The buildings projected by Pericles on the Acropolis, though occupying a period of some thirty years in their construction, all show a common character. They are all the results of a common impulse, and all alike are examples of the perfection of the culminating style. It will be best, therefore, to consider them in their local relation to each other when the whole series was complete, rather than chronologically. In this way a more comprehensive impression of the whole group will be obtained.

The approach to the Acropolis from the time of Pericles onward to the first century of our era was by a picturesquely winding paved way which passed through what remained of the ancient Pelargikon along the foot of the Nike bastion and so again winding upward to the colonnades of the Propylæa. As the roadway approached the north side of the Nike tower a short flight of steps led up to its precinct on the commanding summit of the projecting rampart. The space was enclosed by a parapet, the outside of which was adorned, perhaps to celebrate victories of Alcibiades, by low-reliefs, the remaining slabs of which, among the most exquisite products of Greek art, represent winged Victories in various graceful and symbolic attitudes.

The gem-like temple itself is of the modified Attic Ionic (Headpiece to Chapter V). In plan it is a simple tetrastyle amphi-prostyle shrine, its naos hardly more than twelve feet on the side, entirely open in front, with three openings, separated by mullions, giving through the protecting bronze grilles a clear view of the statue of the goddess within. Owing to the small scale the columns are unusually sturdy for Ionic shafts, and for the same reason the intercolumniation is relatively wide. The capitals, of somewhat archaic form, have a rather wide spread, but are strong, almost block-like, in expression; but of most delicate form and proportion. Its continuous carved frieze represents on the eastern front an assembly of the gods similar in idea to that of the eastern frieze of the Parthenon, and on the sides battles of Athenians against Persians and against Greeks — doubtless the Bœotian allies of the Persians at Platæa. It is an inspiring suggestion that these beautiful groups faced toward the scenes of the great victories of Marathon, of Salamis, and of Platæa. The frieze is continuous, but the sculpture is carefully composed in relation to its position and with clear recognition of the intercolumniation. The centre of the eastern frieze is clearly emphasized and the frieze has a balanced grouping. While continuous in movement it is nevertheless subtly divided over the colonnades into four groups corresponding to the intercolumns below, and is clearly terminated at the angles. Greek sculpture of the fine period is always so composed as to take its place as an essential part of the architecture. The pediments, there is little doubt, were left plain. The Ionic order seems especially appropriate to this small, jewel-like monument, especially in its position contrasting with the larger Doric colonnades of the Propylæa.

As the visitor of the centuries following the time of Pericles passed on up the winding slope, he had before him the majestic hexastyle Doric portico of the Propylæa (Figure 99), surmounted by its pediment, which was left without sculpture. The central intercolumniation was wider to admit of the passage of the roadway for chariots and animals, which continued the slope through the colonnades of the entrance hall, while on either hand steps led up to its level paved floor. The central lintel, about fourteen feet in span, is the largest block of Pentelic marble in Athens. To the right was the smaller colonnade — also Doric, tristyle in antis — of the small south wing, the arrangement of which is so peculiar as to leave no doubt that here the original design was not carried out, and was somewhat awkwardly reduced. A corresponding colonnade of three columns in antis gives access to the north wing, the interior of which was, in Pausanias' day, still decorated with wall-paintings of Polygnotus and others, which were placed above a dado moulding of bluish Eleusinian marble. Hence it has its name of Pinacotheke or Hall of Paintings. In order that these paintings might be

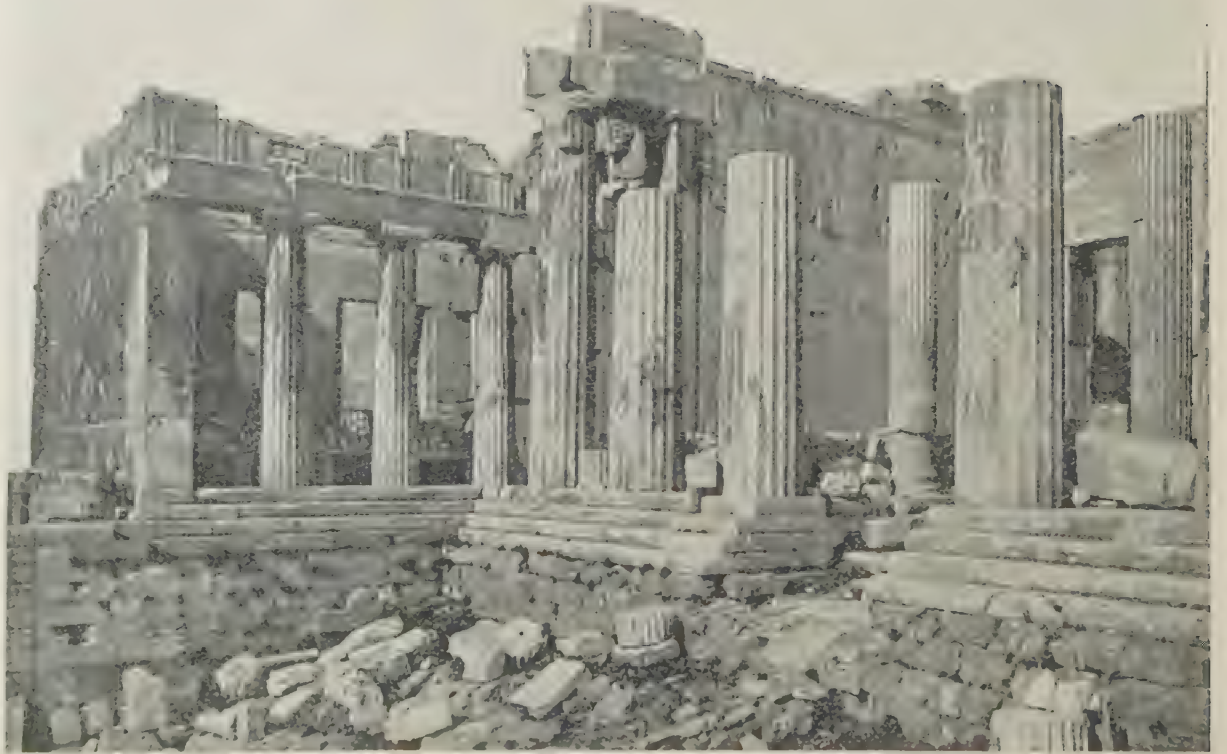


FIGURE 99. THE PROPYLÆA, FROM THE APPROACH.

well lighted, the front wall beneath the portico was pierced with windows which still exist, unusual examples of the treatment of windows in connection with the Doric order. They are simple rectangular openings, the lintels of which are supported by piers crowned with simple anta mouldings. Both wings had hipped roofs. The smaller colonnades of the wings contrast agreeably and give scale to the Ionic columns of firm and delicate design, which, arranged three on each side of the central roadway, supported the main roof. The volutes of their capitals have much less spread than those of the earlier period and relatively much less than in the Nike temple. The marble architraves supported by these columns rested directly on the epistyle of the outer Doric order, and themselves carried directly the marble beams with their coffered marble slabs which formed the ceiling of the hall. Across the eastern end of the hall ran a wall pierced with a group of five doorways of symmetrically varying heights which, except the central opening for the roadway, were reached by steps running across the hall. They gave access to the inner portico, which was in all respects similar to the outer, but at a higher level (Figure 100). The variation in height of the two pediments was entirely hidden by the slope of the approach.

It will be seen that the plan is a more monumental and elaborate version of the scheme of the Mycenæan propylæa as found for instance in the palace of Tiryns. But in the contrasting sizes of its outer colonnades, and above all in its harmonious union of Doric and Ionic forms in a single structure, it showed an entirely new and original development. The consciously ordered grouping of large and small masses, especially the symmetrical contrast of larger and smaller colonnades in a long front, constitutes an entirely new depar-

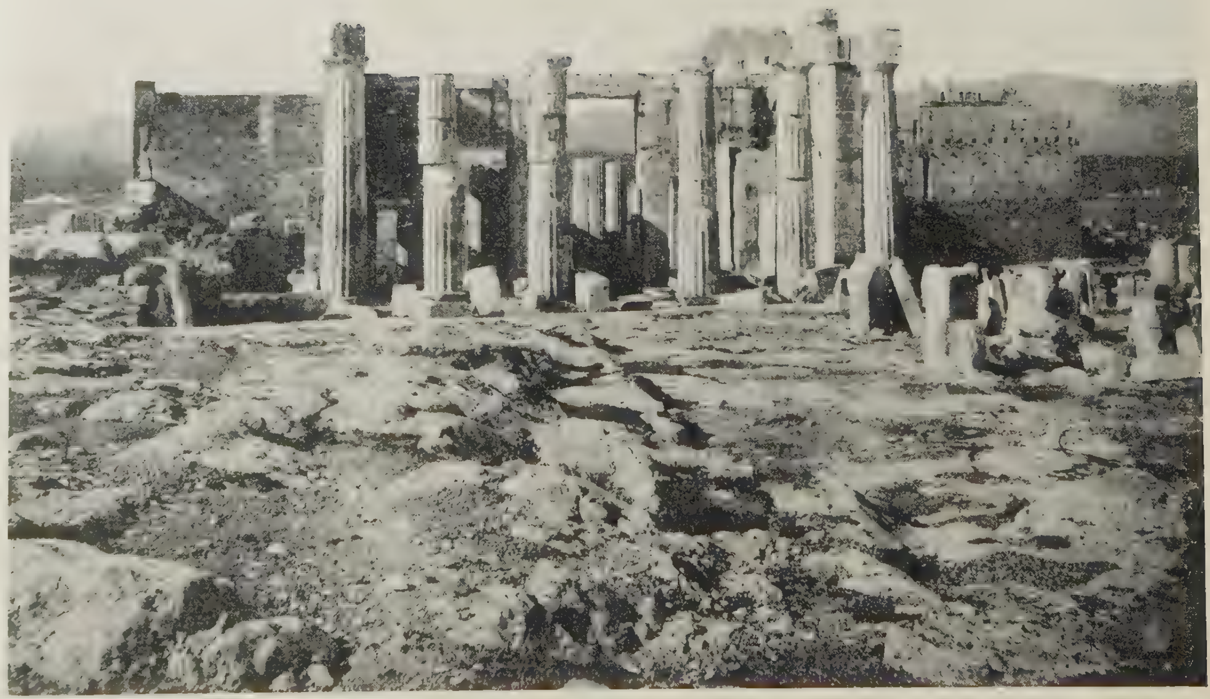


FIGURE 100. INNER PORTICO OF THE PROPYLÆA.

ture in architectural composition, and one which was to be richly fruitful in its influence on later styles. No such superb gateway had hitherto been built or even attempted. It was a worthy introduction to the sacred precinct of Athens, to the citadel of the city which aspired to the leadership of Greece. Twice in subsequent times it was imitated: once at Eleusis, once at Lindos.

Surpassing and unequalled in beauty as was this wonderful gateway, the original plan of its architect, Mnesicles, contemplated a scheme even larger and more effective (Figures 101 and 102). The south wing was to have had a second chamber, which possibly would have been connected with the tristyle portico by a door, as in the case of the entrance to the Pinacotheke opposite, contrived in the now solid wall, and a colonnade of four columns in antis was intended to give access toward the Nike temple, the view of which through that portico would have been most effective. The intention to build such a colonnade explains the existence of the otherwise inexplicable isolated pier which now, except for carrying the end of the entablature of the tristyle portico, stands uselessly in front of the south wing. Toward the interior of the Acropolis flanking porticoes with a frontage of nine columns each were intended to carry in still more telling fashion the idea of the contrasting colonnades of the outer front. Within these Doric porticoes a central row of four Ionic columns, widely spaced because carrying wooden girders, were intended to carry the ridge beam of each hall, an arrangement which recalls that of early building, like the temple at Neandria. That these porticoes were intended, is shown by the position of otherwise meaningless antæ on the side walls of the inner main portico, by sockets left for the roof beams in the inner

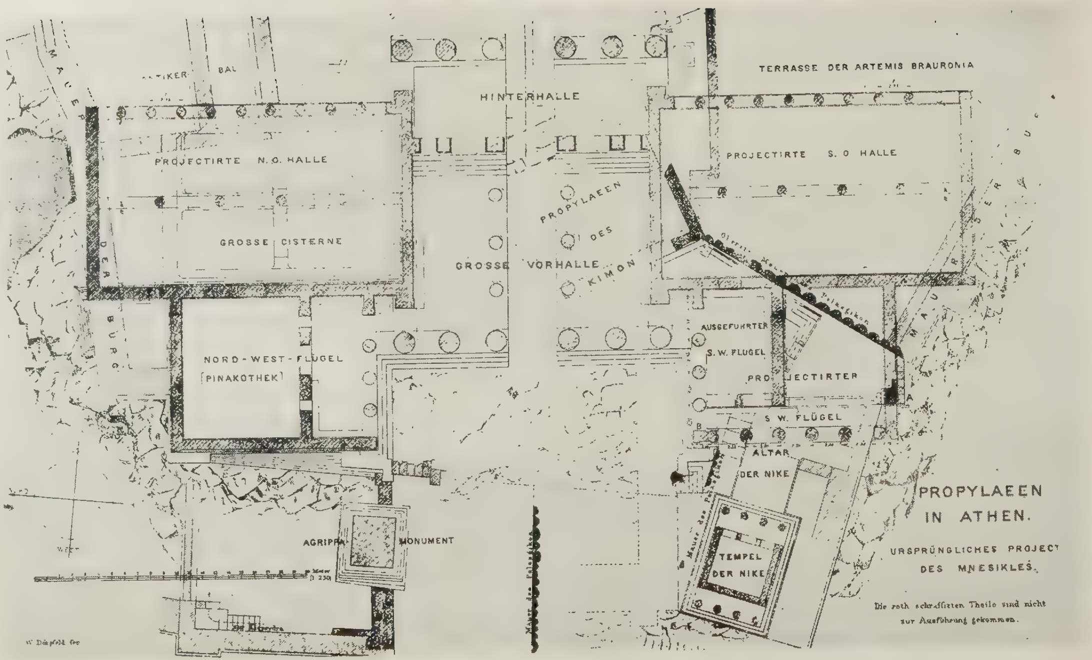
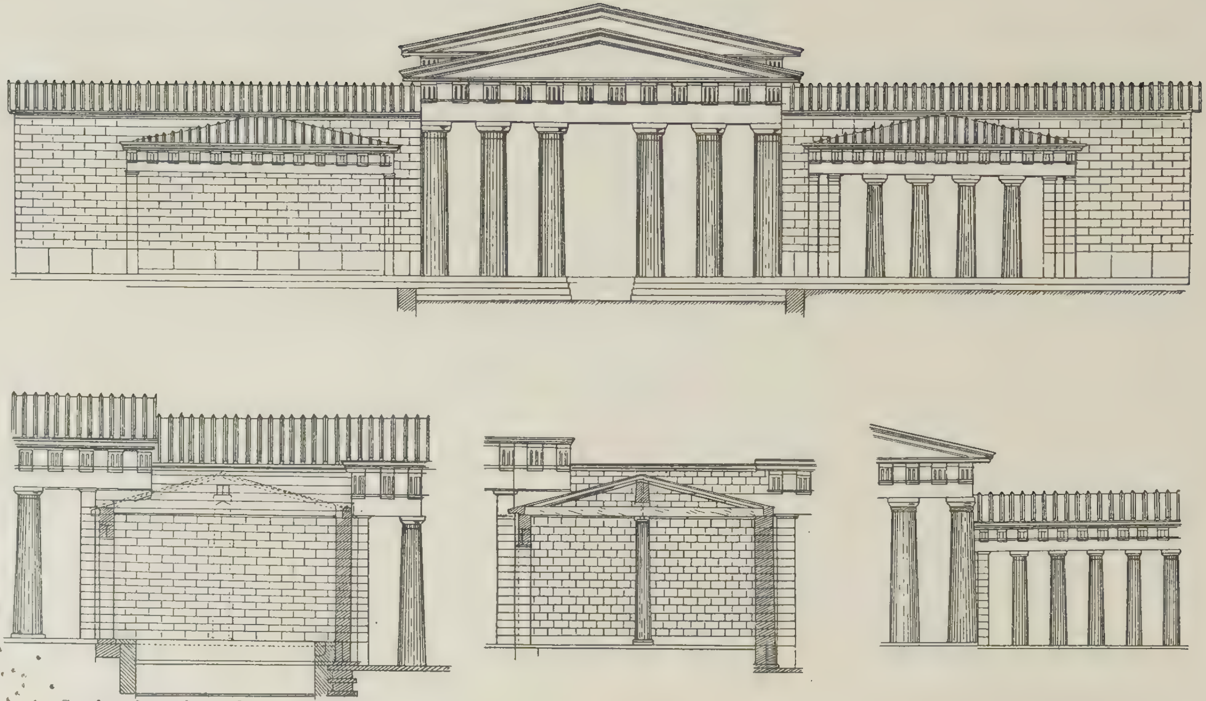


FIGURE 101. THE ORIGINAL PLAN FOR THE PROPYLÆA

From the restoration by W. Dörpfeld in "Athenische Mittheilungen," Vol. X (1885), Pl. 2.



Section through northeast portico.

Northeast portico.

FIGURE 102. THE PROPYLÆA, RESTORED.

From the drawings by W. Dörpfeld in "Athenische Mittheilungen," Vol. **X** *(1885), Plate.*

wall of the wings, and by foundation stones still in place showing the intended continuance of these walls. Had this design been carried out, the porticoes of the gateway within would have occupied the whole width of this end of the Acropolis. Even as it was the building was never entirely finished. On its walls the hoisting bosses of the stones are still to be seen, and other final cutting remained to be done. The change in plan was doubtless due in part to the strain put upon the resources of the state by the Peloponnesian War, and perhaps also by the opposition of a conservative priesthood, which for instance may have objected to the curtailment of the precinct of Artemis Brauronia (Figure 96 : 23) which the building of the south portico would have involved. At this point there still stood also a bastion of the ancient Pelasgic wall, to which the south wing as built had to accommodate itself. Its truncated southeastern angle shows that it was built against the Mycenæan bastion, which would have had to be removed to make room for the projected south portico. Even in its reduced form the Propylæa of the Athenian Acropolis probably surpassed in beauty any great gateway ever built.

Emerging from the inner portico of this imposing entrance, the visitor would have before him a vision of serene and impressive beauty. Immediately in front he would see Phidias' colossal bronze statue of Athena Promachus, while beyond to the right in picturesque perspective the majestic mass of the Parthenon, its western façade turned slightly from him and showing in the pediment the sculptures representing the fabled contest of Athena and Poseidon. Somewhat to the left behind the Promachus could be seen the delicately beautiful group of the Erechtheum. Passing along the sacred way flanked by numerous statues and monuments, past the precinct of Artemis Brauronia, the visitor would have on his right the portico of the Chalcotheke and beyond it the south wall of the Acropolis. He might then pass up a broad flight of several steps to the epinaos of the Parthenon, or, continuing along its northern side and perchance looking up between the colonnades to the frieze of the Panathenaic procession, he might continue along the sacred way, turning to enter the main eastern front of the temple with the great group of the birth of Athena looking down upon him from the pediment.

The Parthenon (Frontispiece and Figure 103) was the fullest expression of Greek genius in design. In all architecture the problem is to produce from given materials a building for certain purposes in such a way that the whole shall be a beautiful organism, perfectly expressing its function and construction, with every member suited to perform its work and to express its use most perfectly. In the Parthenon this is achieved fully for the first time. It has been achieved but once again, in the perfected Gothic cathedral, and then with less simple means. Thus it is that we find in the perfected Greek temple the example of all others best fitted to teach us the principles of supreme success in architecture. Such greatness, to be sure, is only produced by the combined effort of a whole people working for a long time. The Egyptian and other pre-classical styles had only partly fulfilled the requirements just set forth, frequently employing secondary forms lacking in expressive character. The Greeks, as a result of prolonged evolution, at the height of Attic civilization shaped the elements into a perfect whole in the Parthenon.

The material used was the marble from Mount Pentelicus, where the quarries may still be seen, with their runways down

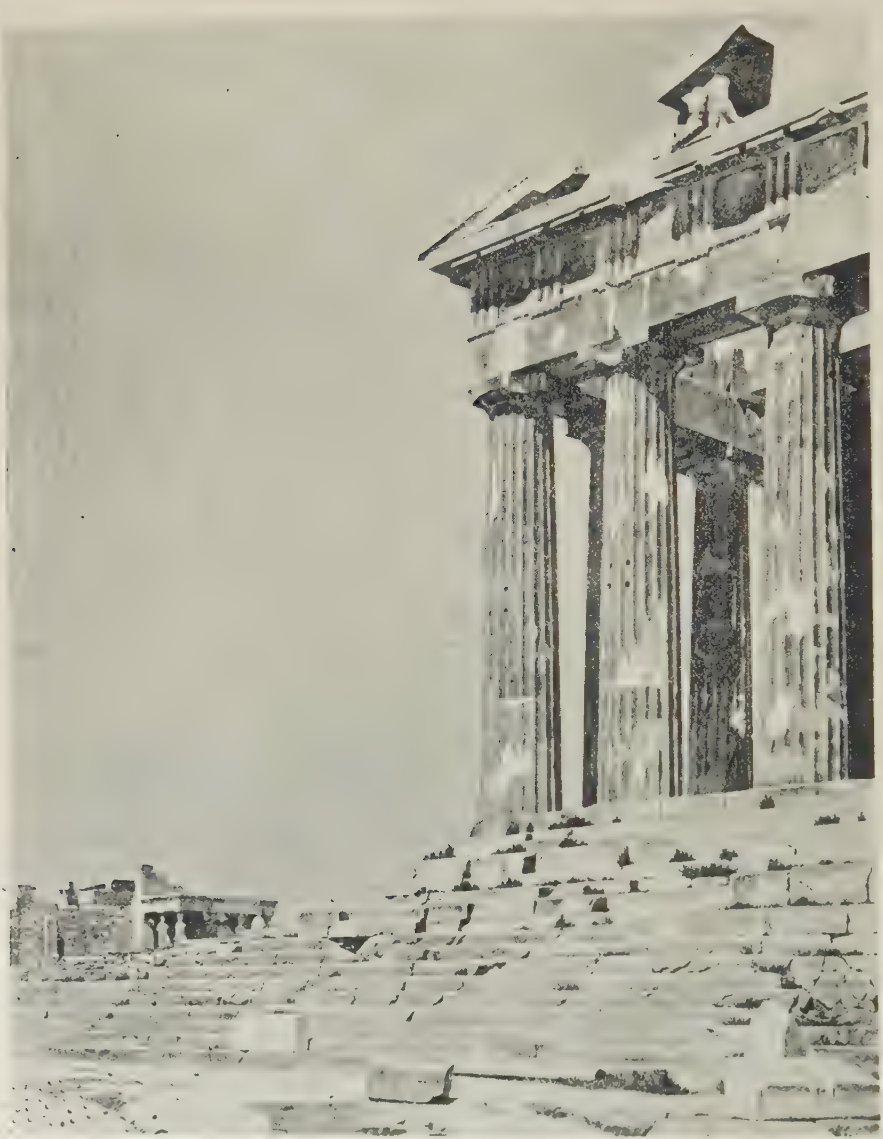


FIGURE 103. NORTHWEST CORNER OF THE PARTHENON.
From the painting by Harold B. Warren in the Boston Museum of Fine Arts.

the mountain side, down which the blocks were slid on sledges. It was a material perfectly adapted for building, easily worked, yet strong. In it the finest detail could be executed, with edges perfectly sharp, and a surface smooth enough for the direct application of color.

The temple is octastyle, with seventeen columns on the flank (Figure 104) — the ratio between the external dimensions of the peristyle, one hundred by two hundred and twenty-five Attic feet, being four to nine. The cella is very broad, leaving a pteroma narrower than formerly was usual, and the proportions of its main body exactly repeat the proportions of the whole building. The ends of the cella are not treated as usual with columns in antis, but have each a prostyle arrangement of columns, six in number, giving a richer form to both pronaos and epinaos. In spite of the similarity of these vestibules the temple had a distinct front and rear, owing to the internal arrangement. The pronaos gave access to the cella proper — the *naos hekatompedos*, or "hundred-foot chamber" — which contained the cult-image of Athena in gold and ivory. The width of the room was divided into three aisles by colonnades superimposed as in the great temple at Pæstum. A departure from the traditional scheme of such colonnades was made, however, in that, instead of continuing longitudinally to the rear wall, they were turned across to join one another behind the image, on the model of the peristylar halls of the Orient — here followed for the first time in Greece. From the epinaos opened a rear chamber — the *parthenon* proper, or virgins' chamber — unconnected with the main room, and used as a treasury of the goddess. Its ceiling seems to have been upheld by four Ionic columns, introduced into the Doric temple by the Attic architects in

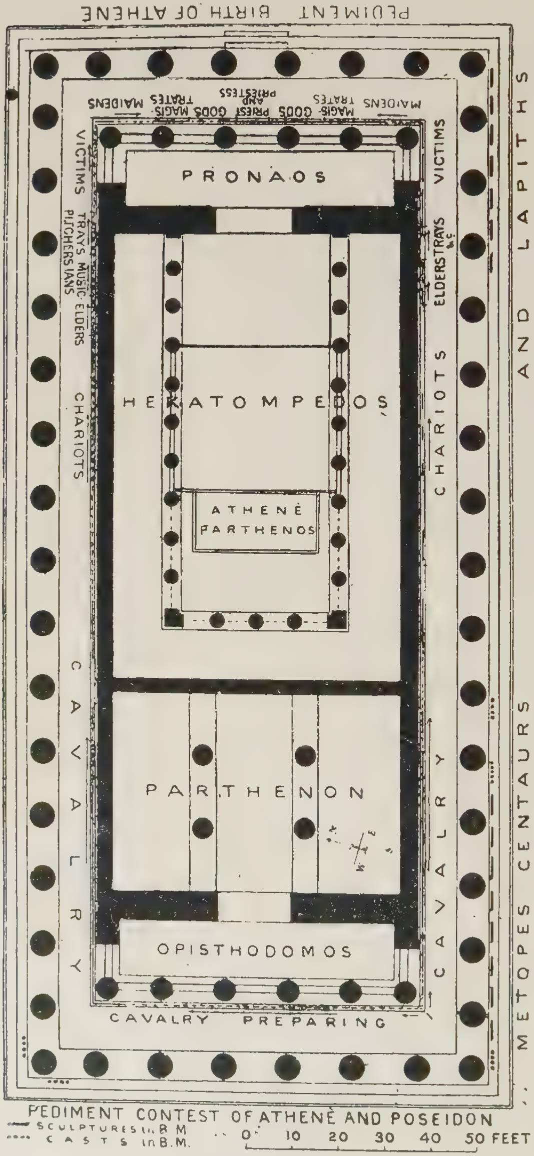


FIGURE 104. PLAN OF THE PARTHENON, SHOWING THE DISTRIBUTION OF THE SCULPTURE.

From the drawing (after Dörpfeld) in A. H. Smith's "Guide to the Department of Greek and Roman Antiquities in the British Museum" (1912), p. 19.

order to compass the whole height by a single order, as the slenderness of the Ionic shaft permitted them to do without too great waste of space. The lighting of the cella, which was formerly supposed to have been *hypæthral*, or roofless, is now generally agreed to have been provided only by the great doorway. The brilliant sun of southern latitudes enabled this to furnish ample illumination for a room devoted to religious worship, in which a certain sombreness and mystery were actually desirable.

The Parthenon rests on a great substructure of stone, made necessary by the shelving surface of the native rock of the Acropolis. Thus one corner of the stereobate rests directly on the rock, whereas the diagonally opposite corner is some thirty feet above the rock — the pavement being brought up to a level by filling between the foundation and the Acropolis wall.

The exterior order, like that of all Doric buildings of Attica henceforth, partakes somewhat of the more slender proportions and more delicate detail of the Ionic, just as the Ionic of Attica takes on something of Doric sturdiness. The employment of marble lent itself to greater relative heights and broader spans. The columns, with an average diameter of 6.25 feet, attain a height of 34.26 feet, in a total height from the top of the stylobate to the summit of the pediment of fifty-nine feet. Their diminution is approximately one twenty-fifth of their total height. The capital marks the culmination of all the striving of Doric designers for subtlety and elasticity of form, with its five delicate annulets, its echinus of sharply quirked hyperbolic section, just enough removed from a straight line to have at once strength and grace (Figure 105).

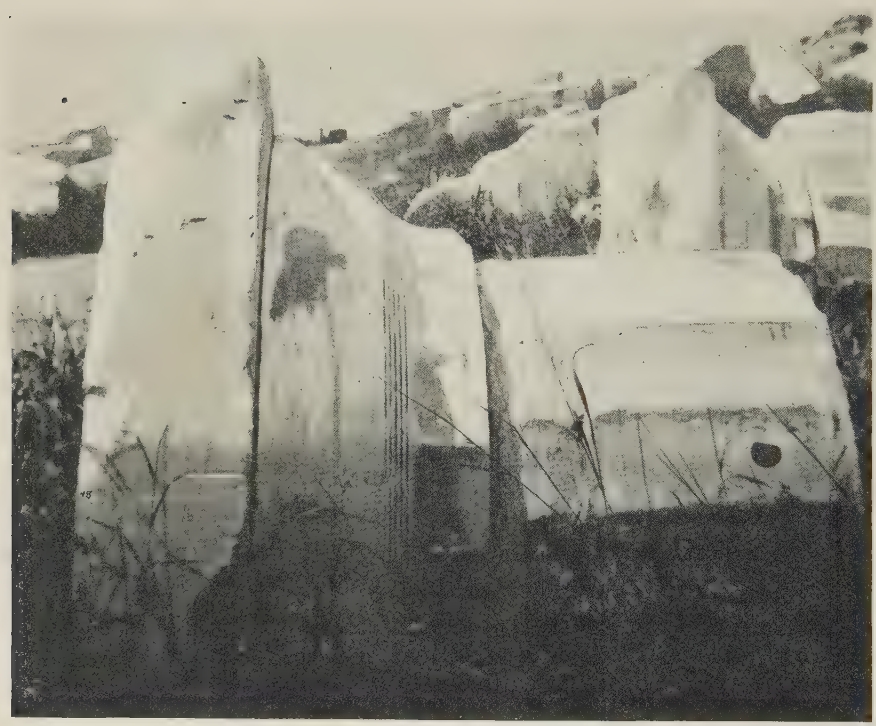


FIGURE 105. A CAPITAL OF THE PARTHENON.

The entablature is much lighter in proportion to the height of the column than was the case in the earlier temples of porous limestone. Its total height of eleven feet has a ratio of but .314 to the height of the column, against .476 in Temple D at Selinus, for instance. The epistyle blocks average fourteen feet in length, the metopes about four feet four inches square — dimensions much less, to be sure, than those of the great Sicilian temples, but considerably larger than those of any temple yet built in Greece itself. At the top of the frieze, above both metopes and triglyphs, where the cornice rests, is a tænia with a small astragal carved with bead and reel ornament, an Ionic feature peculiar to the Parthenon.

Within the peristyle, the whole cella is raised two steps above the pteroma, and the common base of the pronaos and epinaos columns is further emphasized by a slight sinkage toward the interior. These columns are even more slender than those of the exterior order, having a height of thirty-three feet with a diameter of only five and a half (Figure 106). Above their epistyle runs a frieze, not of triglyphs and metopes, but of continuous sculpture, crowned by a moulded block. It is an Ionic motive, here introduced for the first time into a Doric order. Indeed the existence of regulæ and guttæ below it seems to indicate that a Doric triglyph frieze had first been intended, and that the adoption of a continuous frieze was a change of plan during the progress of the work.

The execution was of a marvellous perfection of technical handwork. Unlike the earlier temples of porous stone in which the profiles required a coating of stucco for their final outline, the Parthenon had all of these worked directly in the marble, with the utmost delicacy and accuracy. The surface indeed was probably not left untouched, but, as Pausanias relates, those portions in the sunlight were stained with a wash of saffron and milk, and the shadowed portions were more strongly colored. Certain traces preserved enable us to determine that the triglyphs, the regulæ, and the mutules were blue, the metopes and the intermutules red. Stencilling by the weather reveals that frets and anthemion patterns in color decorated the abaci, the tænia, and other members.

The Parthenon, more than any other Greek temple, is full of subtle departures from mechanical regularity and

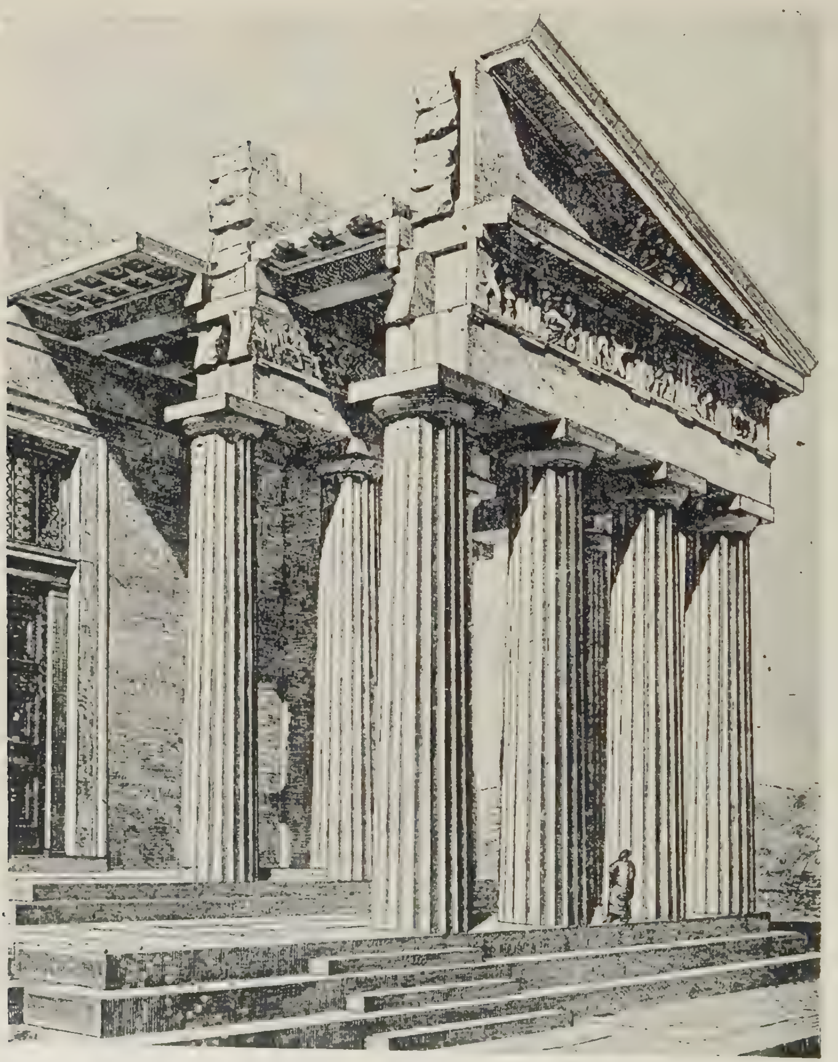


FIGURE 106. PERSPECTIVE SECTION OF THE PRONAOS OF THE PARTHENON, SHOWING THE CONSTRUCTION

From the drawing by George Niemann in "Wiener Vorlegeblätter" (1875), Pl. 12.

uniformity, constituting architectural refinements which, although not consciously analyzed, are felt, and add greatly to the beauty and vitality of the effect. Most obvious of these is the decrease in the corner intercolumniations, amounting to over two feet. But here this is not the only variation in the spacings: the centre intercolumniation is wider than the normal ones to either side, the metopes decrease slightly toward the ends. Although the triglyphs consequently do not come quite on axis with the columns, they are delicately adjusted so that in spite of this no awkwardness is felt. On the sides also there are variations in spacing, but they are less marked. The diameters of the columns are not thoughtlessly uniform. The angle columns are notably thicker (6.388 feet against the average of 6.251), compensating for the apparent loss of thickness through diffraction when they were seen against the bright sky, and giving a definite termination to the colonnade. Obviously their greater thickness tends to decrease still further the corner intercolumn. Aside from this special modification there is a slight variation in the diameter of the other columns — over and above a reasonable mason's error — which, so far from detracting from the effect, adds an element of breathing life.

In the whole building there is scarcely a rigid straight line or a vertical line. The upper edge of the stylobate is slightly bowed up on all sides, rising .228 feet in the centre (Figure 107). This curvature was an intentional feature of the original construction. It is almost perfectly regular, and cannot be due to settlement, as the lowest corner, at the northwest, rests directly on the solid rock. The curvature begins even in the crepidoma, where it amounts to .15 feet, and is repeated by a very slight upward bowing of the

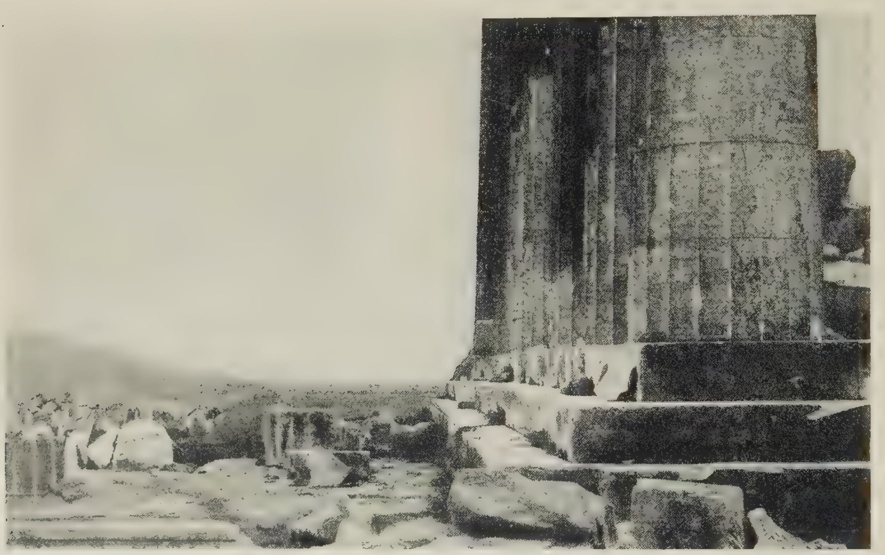


FIGURE 107. CURVE OF THE STYLOBATE, EAST FRONT OF THE PARTHENON.
From W. H. Goodyear's "Greek Refinements" (1912), Fig. 8.

entablature. None of the columns is perfectly vertical; all incline inward slightly. The intermediate columns of each face lean in directly; the corner columns lean in on the line of the diagonal. The departure from verticality is relatively slight, to be sure, reaching a maximum of .231 foot, but it was made quite consciously. The lowest drum of each column was cut with its outer side higher and its upper face slightly inclined, whereas the other drums are regular until the upper one, under the capital, is reached. Here a correction is introduced so that the soffit of the entablature may be horizontal. The walls of the cella leaned inward somewhat less than the columns; the anta ends leaned forward. The columns, as usual, had a curvature or entasis in profile, here very delicate. The maximum departure from a straight line, occurring at a height of about two fifths that of the column, amounts to but .057 foot.

The motives for all these subtle modifications of obvious regularity were essentially three: preference for the greater sheer beauty of curved lines rather than straight; appreciation of the effect of vitality produced by a freehand character, as against mechanical monotony; and desire for the heightened unity resulting when the whole was given a beginning, a middle, and an end, and when no part could be transposed without injuring the coördination of the whole. Thus the building was endowed with the characteristics of a living organism.

Equally notable are the thought and skill given to construction. No mortar was used, but the joints are so finely squared and smooth that the limestone has actually grown together in many instances. The cella walls are of squared ashlar masonry, consisting alternately of a course of two lines of stretchers, running lengthwise, and a course entirely of headers running through the wall. The inside of the joints is hollowed out to insure even bearing on the margins, and the blocks are fastened together by iron dowels. Similarly the drums of the columns are slightly hollowed within a plane margin some six inches wide. In the centre is sunk a square hole in which a block of olive wood was placed having a circular projection fitting a hole in the block of the drum below. This permitted the drum to be rotated after it was placed in position, so as to grind the bearing surfaces perfectly smooth.

The epistyle consists of three blocks on edge, side by side, touching only at top and bottom, where there are very fine joints. At the corners of the building these epistyle blocks are jointed in a manner extremely effective and ingenious (Figure 108). Iron ties of I-shape, run with lead, bind together the blocks, furnishing security against earthquake, but exposing the stone, as events have proved, to danger of bursting through the rusting of the iron, and of vandalism from later seekers of metal. The frieze, unlike many Doric examples where triglyphs and metopes are merely decorative subdivisions of a continuous block, are constructed in accordance with the structural suggestion of the forms. Each triglyph is a separate stone acting as a small pier; the sculptured metopes are merely filling slabs, relieved of any weight by blocks behind, which stand free but are bound to the triglyph blocks by I's (Figure 109). The cornice blocks extend nearly through the wall, so that they balance safely. Each embraces one mutule and one adjacent space; except the corner blocks which carry four mutules, two on each exposed side. On the cornice, at the gable ends, are built the pediment walls, their face of thin slabs of marble tied to a rough wall behind, which supports the blocks of the raking cornice.

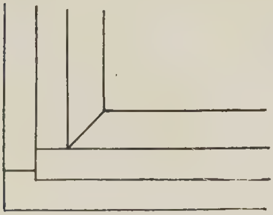


FIGURE 108. — EPISTYLE BLOCKS AT AN ANGLE OF THE PARTHENON.

The roof was undoubtedly supported by rudimentary trusses, for which the socket-holes have been found, quite far apart. On them rested the framework of purlins and rafters, carrying the tiles directly without the need for a continuous wooden sheathing. The tiles themselves are of marble, broad and flat, with the edge turned up to fit beneath a covering tile over the joint. The lower edge of each tile hooked over the raised upper edge of the tile below. Along the raking cornice is a special gutter tile with the cymatium, and on the corner tile the cymatium is stopped by a decorative lion's head. The acroterium fitted a socket in a block fitted over the tiles, having the first of the antefixes carved upon its face.

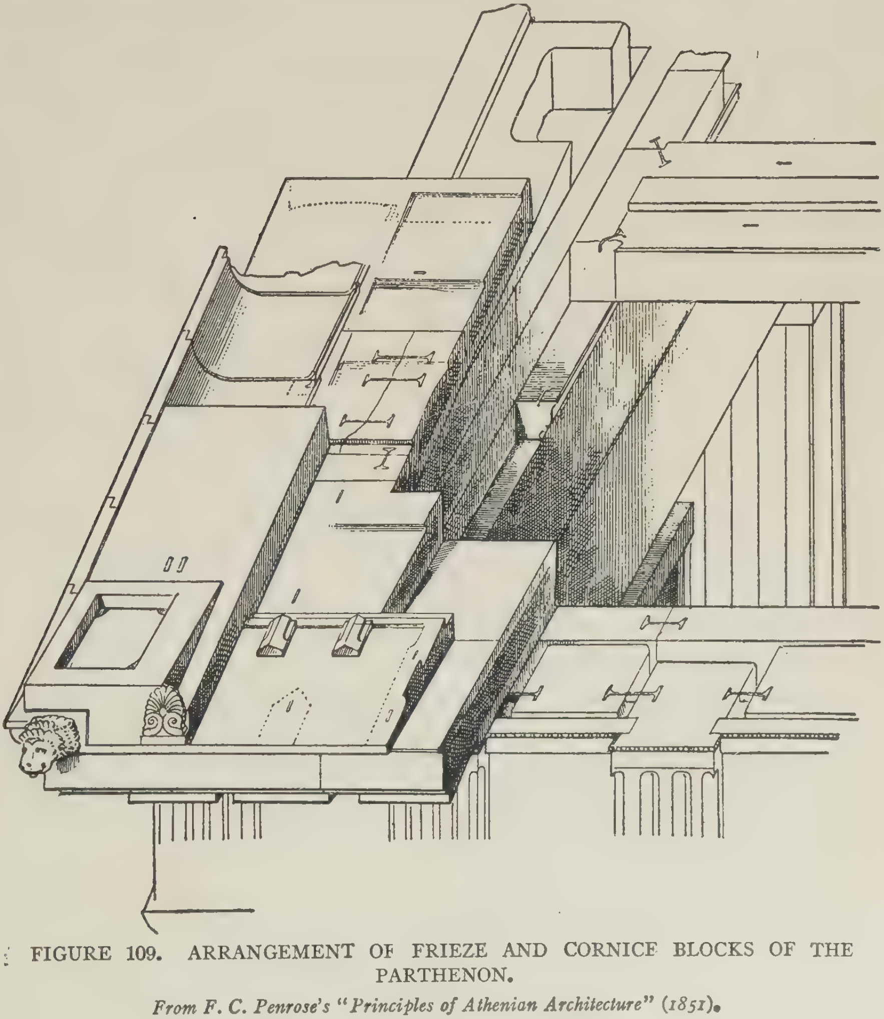


FIGURE 109. ARRANGEMENT OF FRIEZE AND CORNICE BLOCKS OF THE PARTHENON.

From F. C. Penrose's "Principles of Athenian Architecture" (1851).

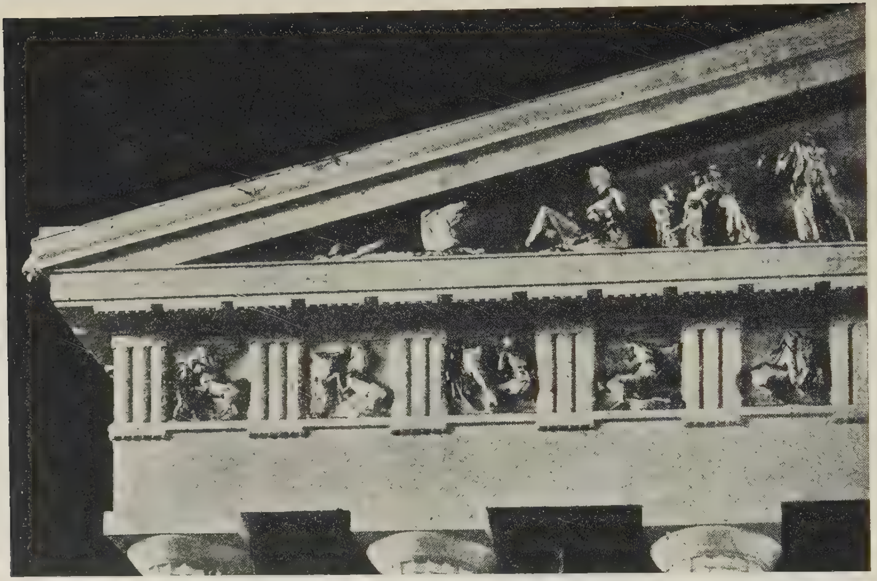


FIGURE 110. LEFT HALF OF THE EAST PEDIMENT OF THE PARTHENON.
From casts as set up in the Musée du Cinquantenaire at Brussels.
(The metopes are from the south face.)

Dovetail-like holes in the top of the cornice blocks reveal that a "lewis" of metal was used to hoist the stones into place (Figure 83 : xvi).

The Parthenon had sculptured decoration of a richness and completeness unequalled by any other Doric temple. Not only were the pediments and all the metopes filled with figures in bold relief, but for the first time in Doric architecture a continuous frieze sculptured in low relief was carried above the columns of the pronaos and around the whole body of the cella. The subjects represented were chosen and distributed with the greatest appropriateness. In the eastern pediment was shown the miraculous birth of Athena, in the

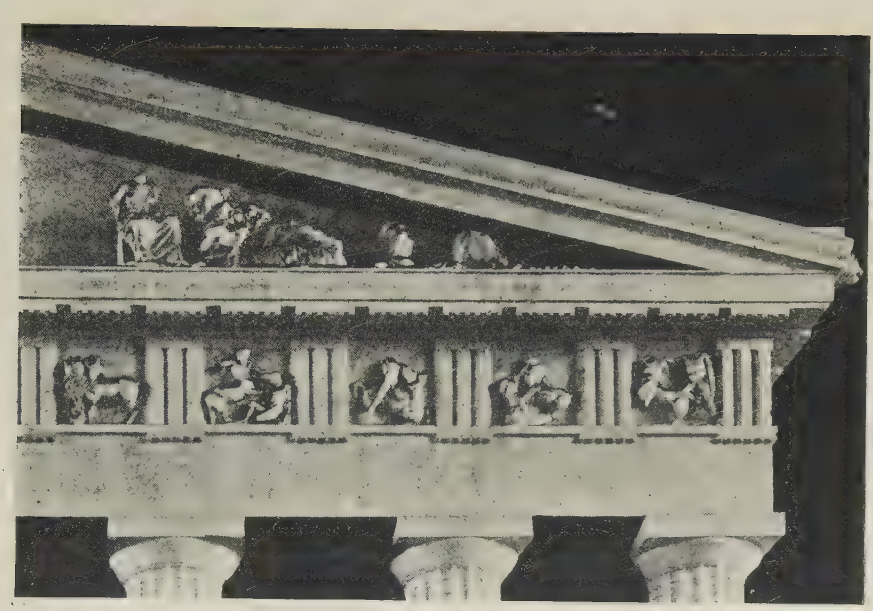


FIGURE 111. RIGHT HALF OF THE EAST PEDIMENT OF THE PARTHENON.
From casts as set up in the Musée du Cinquantenaire at Brussels.
(The metopes are from the south face.)

western pediment her victorious contest with Poseidon for the patronship of Attica. In the metopes appeared episodes from the legendary history of Attica; the struggles between gods and giants, Lapiths and centaurs, Greeks and Amazons, Greeks and Trojans. In the frieze was unrolled the splendor of the pan-Athenaic procession, which bore every four years a new sacramental garment to the goddess.

The metopes were carefully composed both separately and as a whole. To each panel was assigned an episode, generally of two figures, and these were artfully disposed so as to take advantage of every possibility of varying the action, yet of preserving a balance of motions within the square frame. The angle metopes had a vertical movement; between, the groups of metopes balance. On the two façades, at least, there was a general movement from either side toward the centre, with a very regular alternating rhythm in the panels. As the metopes had necessarily to be carved and put in place before the cornice blocks could be laid, and Phidias was thus forced to call to the assistance of his pupils some sculptors of an older school, the metopes thus sometimes betray an earlier style than that of the pediments, — panels of a certain archaic hardness mingling with others of the greatest mastery. From the distance at which they were seen in place, however, this unequalness tended to disappear, and the sculptures formed a unified decoration, enlivening and harmonizing at once the rigid horizontal and vertical lines of the entablature.

The pediment sculptures were groups of free-standing figures of heroic size, very carefully designed with reference to their mutual relations and to their position on the building (Figures 110 and 111). There was no longer, as at Ægina and at Olympia, a rigid central figure separating the two sides. In each case two figures — Zeus and Athena, Athena and Poseidon — balanced each other by an opposition of inclined lines. From the violent action of the central groups, with their miracles which provoke the astonishment of the nearer divine spectators, the movement diminishes at either side to the cadence of the impassive figures near the angles. The groups — standing, then seated, then reclining — are combined with so harmonious a rhythm of lines that the adaptation to the slope of the pediment seems spontaneous and inevitable. The mastery of the external anatomy of the human form and the naturalism of treatment surpasses anything hitherto

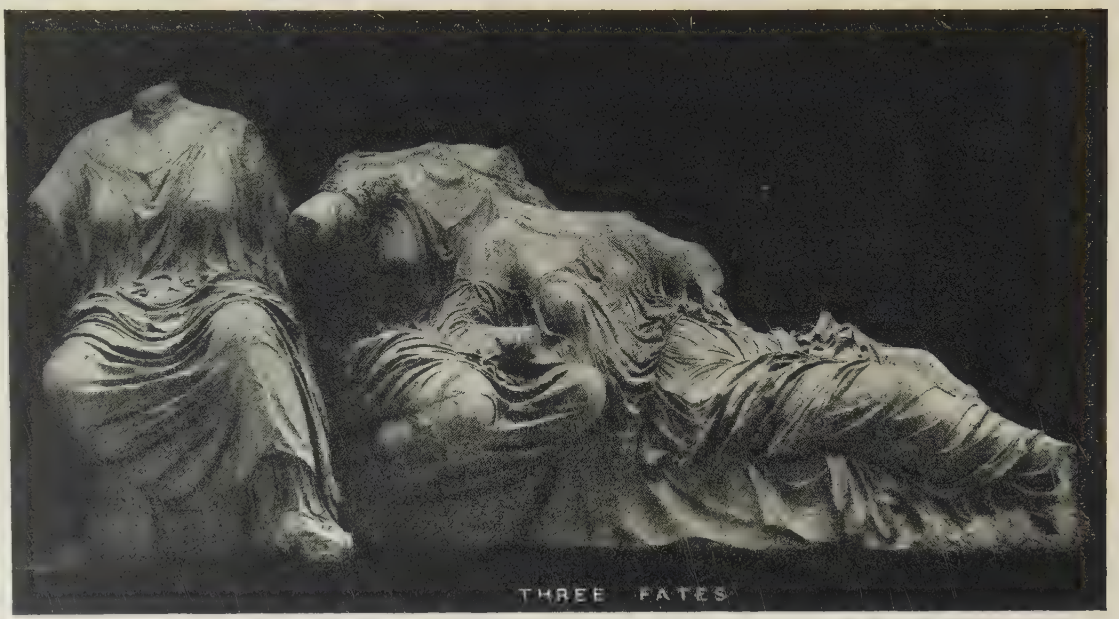


FIGURE 112. THE "FATES" FROM THE EAST PEDIMENT OF THE PARTHENON.

achieved in Greece and reaches the highest bounds of sculpture, with a serene dignity worthy of the most monumental architecture. In all we can trace the directing mind, in the finest figures, such as the "Fates" (Figure 112), perhaps the hand of Phidias himself.

The frieze had an order and clarity of disposition which makes us forget the difficulty of the problem and certain inequalities of execution due to the participation of different sculptors. Starting on the western end, which the visitor to the Acropolis was the first to approach, it proceeds along the north and south sides in two parallel files, to be reunited in the centre of the eastern front. At the start are cavaliers preparing and mounting, the elaborately draped men's figures alternating with the smooth bodies of the horses. On the long faces, with increasing action, unrolls the procession of galloping horsemen, with their repeating yet ever varying rhythmical lines (Figure 113). Before them go chariots with the charioteers dismounting and remounting in full career, then, as the pace diminishes, appear elders with branches of olive, musicians with flute and lyre, youths with urns and basins of offerings, priests leading the sacrificial animals. Turning the corners to the eastern face, at the head of the procession, advance from either side the ranks of maidens, led by those who have prepared the peplos of the goddess. To view the approach there are ranged the Olympian gods and goddesses, facing to left and right; while in the centre the priest of Athena receives the sacred garment. The polychromy — blue for the background and conventional colors for the garments and accessories — was here especially abundant, made necessary by the position of the work, illuminated only by reflected light. The frieze was indeed

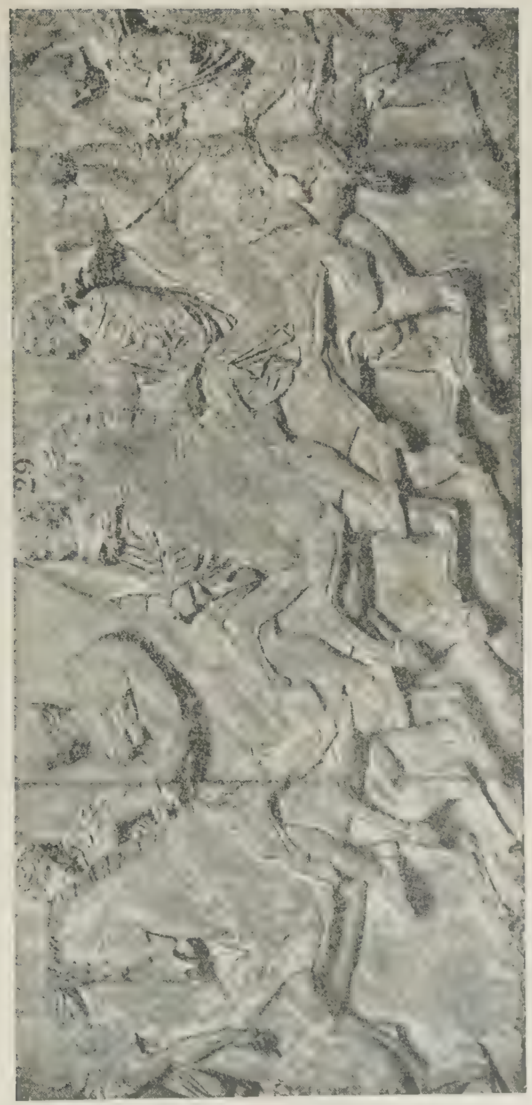


FIGURE 113. CAVALIERS FROM THE PARTHENON FRIEZE.

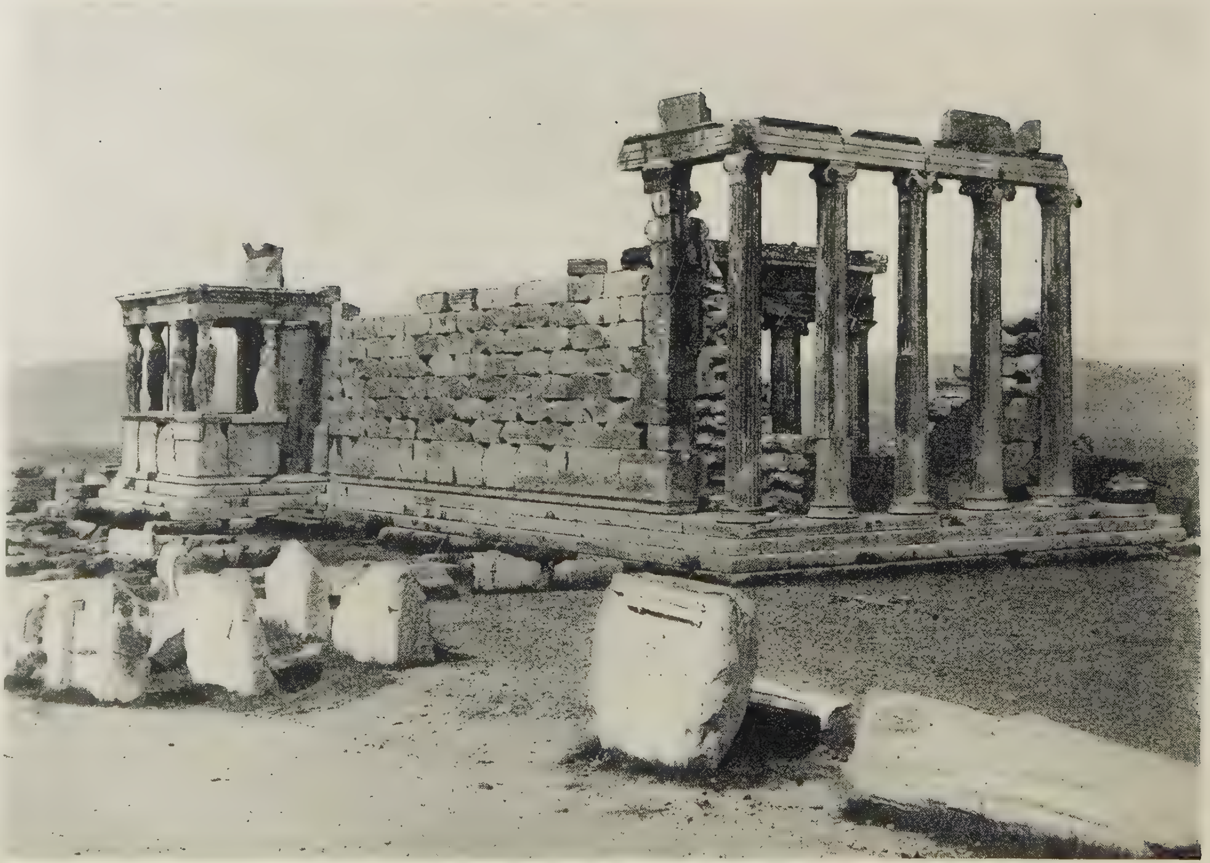


FIGURE 114. THE ERECHTHEUM.

difficult to see from close at hand, and is to be thought of rather as an element of general enrichment and, above all, as a splendid votive offering.

Magnificent as it is as sculpture, the sculpture of the Parthenon was conceived and handled as decoration, and belongs indissolubly with the building. Its great breadth and reserve of treatment of the marble, free from over-detail or excessively anatomical treatment, keeps the character of the structural material. Each element, though a complete whole, is also a part of the general composition.

The Erechtheum (Figure 114) served as a perfect foil to the Parthenon, holding its own with the simplicity, formality, and Doric nobility of the larger building by its elaboration, picturesqueness, and Ionic grace.

The structure is a complex one designed to group in a single building the worship of Athena Polias, the protector of the city, of Poseidon and Erechtheus, the subjects of early Athenian myth; and to preserve the sacred relics of the contest between Athena and Poseidon for the mastery of the city. The problem was further complicated by differences of level in the site. The cella is not surrounded by a peristyle, but has porches to the north and south as well as under the main gable to the east (Figure 115). The eastern portico, of six columns in prostyle arrangement, gives access to the shrine of Athena which contained the ancient *xoanon*, or primitive wooden statue of the goddess, fabled to have fallen from heaven. On the north, outside, a broad flight of steps leads down to a lower level, where rises the great north portico, four columns in width and two in depth. It sheltered an opening in the floor revealing some fissures in the rock, doubtless regarded as the marks of Poseidon's trident, and led into a corridor connecting with the south porch, or Porch of the Maidens. From this corridor two doors seem to have given access to the shrine of Poseidon and Erechtheus, which occupied the remaining portion of the western cella. The north portico projects beyond the western end of the building, and the projecting wall is pierced by a small door which leads into a precinct to the west, in which was the sacred olive tree of Athena. From this precinct a door gives access to the western cella through a low wall, above which rise four Ionic columns in antis, engaged for a portion of their height (Figure 116). The carrying up of this wall, with three windows, was a work of Roman times.

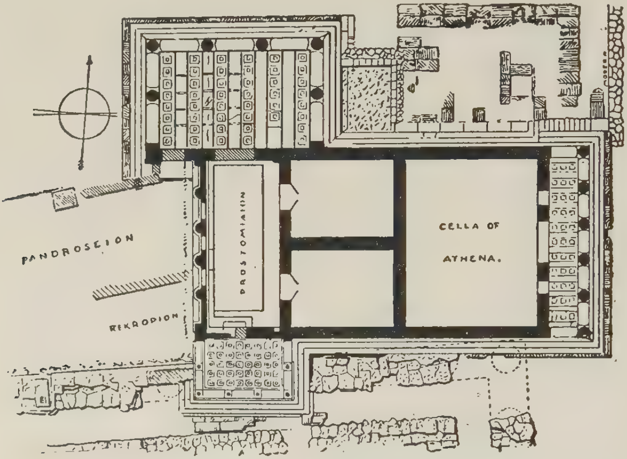


FIGURE 115. PLAN OF THE ERECHTHEUM, RESTORED.
From the drawing by G. P. Stevens in H. N. Fowler and G. R. Wheeler's "Greek Archæology" (1909), Fig. 115.

The building was unfinished at the outbreak of the Peloponnesian War, and the western end indeed was never entirely finished. The irregularity of the plan has led Dörpfeld to suppose that, as with the Propylæa, the original design was for a much larger building, which would have had the Porch of the Maidens exactly on the axis of the north portico, and have had a western wing symmetrical with the eastern one. The evidence here, however, is by no means as completely convincing as in the case of the Propylæa.

Ionic forms are employed throughout, with a richness of detail never equalled in the style either before or since. The order of the eastern portico is of great delicacy and luxuriance, having an Attic base and a band of anthemion about the necking of the capital, both of which are repeated on the antæ and along the walls.

It is excelled, however, by the order of the north porch (Figure 117), in which similar features are given an even

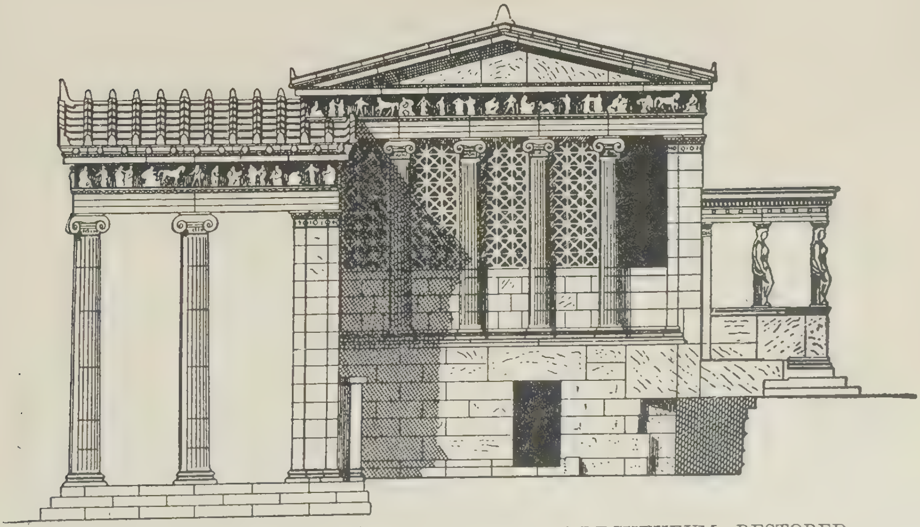


FIGURE 116. WESTERN ELEVATION OF THE ERECHTHEUM, RESTORED.

From the drawing by G. P. Stevens in H. N. Fowler and G. R. Wheeler's "Greek Archæology" (1909), Fig. 117.

more ornate treatment. The columns here are somewhat taller, though also sturdier than those of the east front — nine and one-tenth diameters high as against nine and one third. The upper torus of the base is decorated with a guilloche, and the volutes of the capital, though making only one turn and a half, are elaborately moulded to produce a multitude of spiral lines (Figure 118). The eye of the volute, which is sunk, probably contained a bronze boss, with a fillet of bronze following a sinkage in the volute, and a bronze

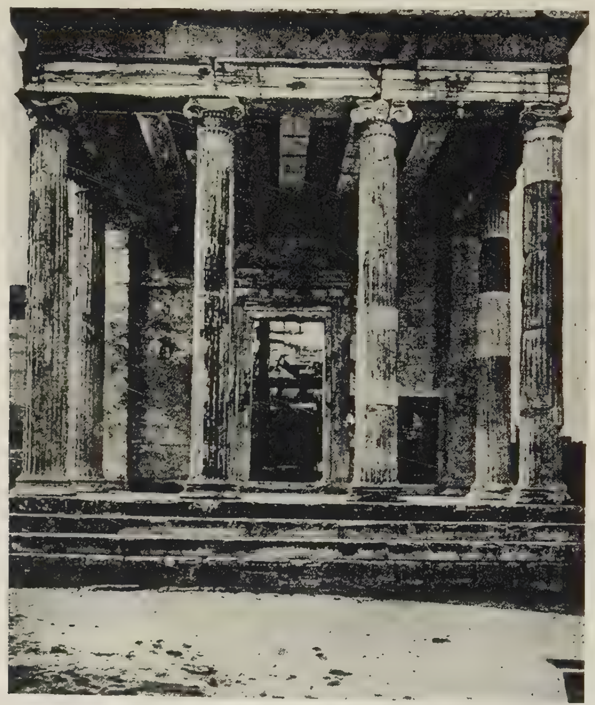


FIGURE 117. NORTH PORTICO AND DOORWAY OF THE ERECHTHEUM.

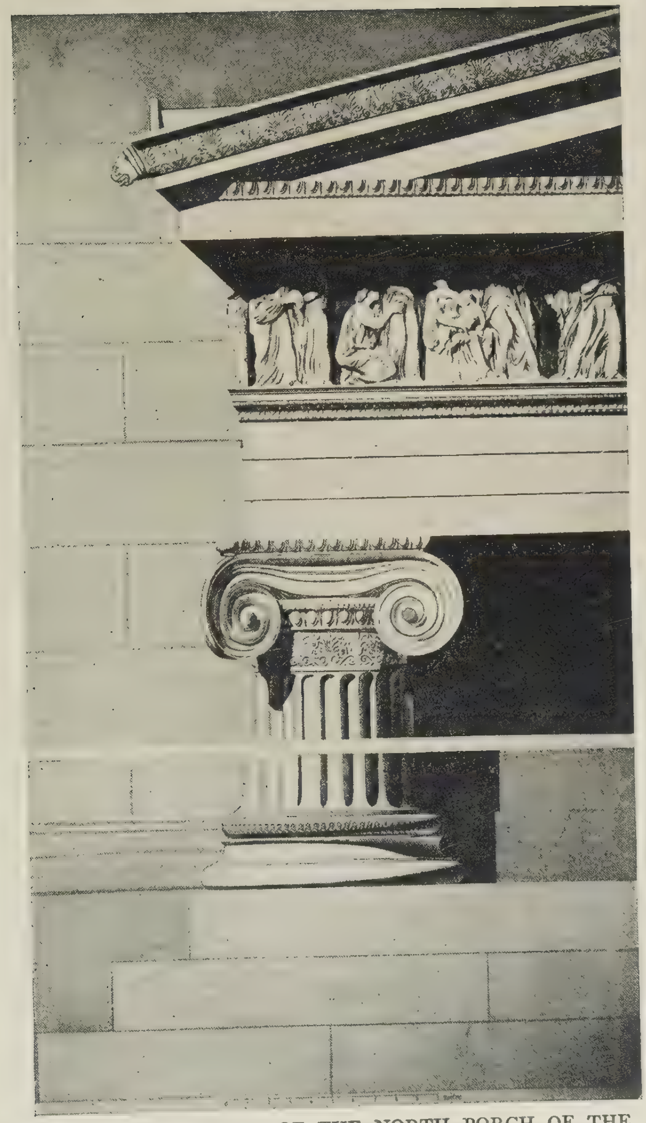


FIGURE 118. ORDER OF THE NORTH PORCH OF THE ERECHTHEUM.

From H. d'Espouy's "Fragments d'architecture antique," Vol. I (1896), Pl. 11.

anthemion in the centre. Between the volutes and the echinus of the capital is a narrow torus, carved with a guilloche like that of the base. The fillet which divides the broad necking band from the shaft is led up to by a small astragal around the fillets which separate the flutes. The marble ceiling of the porch is supported on deep beams twenty feet long, the greatest in free span of any lintels in Greece. They support light coffered slabs, each of which had a gilded rosette in the centre.

The great doorway from the north porch to the interior is the most splendid in all Greek architecture. Its broad moulded frame is surrounded by a band of carved rosettes — a feature of Oriental origin — and surmounted by cornice mouldings and a cymatium with anthemion ornament. The inner moulding of the casing and the carved brackets which support the ends of the cornice are additions of Roman times.

The small Porch of the Maidens, or Caryatides (Figure 119), is so called from having female figures as supports instead of columns. It is a playful motive, impossible to use except at a small scale, but here of entire appropriateness. It had already been employed in the archaic period at Delphi, but was now handled with the greatest mastery, harmonizing the human figure with the architectural members. The figures stand on a parapet wall some six feet high, with a moulded base and coping carved with egg and dart. The entablature which they bear is light, having no frieze, but a high epistyle of which the upper fascia is decorated with a row of disks intended for carved rosettes. The crowning moulding of the epistyle forms the bed moulding of the cornice, which — unlike the other cornices of the Attic Ionic, where the addition

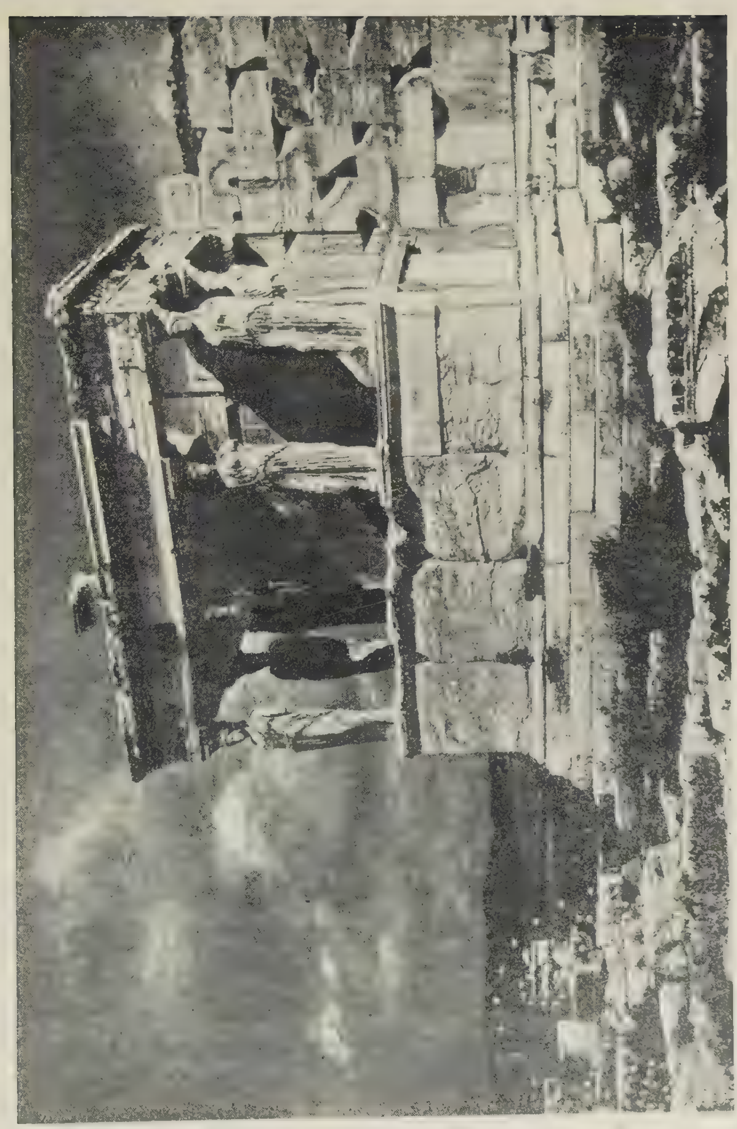


FIGURE 119. THE PORCH OF THE MAIDENS.

of the delicately sculptured frieze had led to the omission of these features — is enriched with dentils. To carry the epistyle a capital is placed on the cushioned head of the figure — a capital with echinus and square abacus as in the Doric, but lightened and elaborated by carving with egg and dart. It is of the type from which the Roman Doric capital was to grow, but was more refined.

The figures themselves show wonderful skill in their adaptation to their function as supports. Those on the sides as well as those on the front all face outward from the building, so that any suggestion of motion in their pose may be in the same direction. They stand easily with one knee slightly bent, the weight borne on the other leg, before which the drapery falls in long, almost conventional vertical folds, suggesting the flutes of a column. This supporting leg is in each figure the one toward the outside, so that a firm support is provided at the corners and there is a balance in the whole group. The organic unity thus secured is heightened by a slight inclination of the figures — outward in this case — emphasizing the curves which they make in profile.

The sculptured decoration of the Erechtheum included, besides the Caryatides, friezes in both the main orders, executed in colored marbles. The background was of blue-gray Eleusinian marble, the attached figures in relief of Pentelic marble. The care given to the execution of even the minor decorative carvings is evidenced by the building accounts of the temple, which reveal that a foot of egg-and-dart moulding was paid for as liberally as a sculptured figure.

The long evolution of the classic forms from their primitive beginnings reached its culmination in these Periclean buildings of Athens. The foundations of classic architecture were laid broad and deep, and on them a glorious superstructure was raised. But more than that, those fundamental principles of architectural expression were established which inhere in every great style, and which influence and inspire the whole subsequent development of architecture in Europe.

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